THE IRON TRADE REVIEW

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HEAVY INQUIRY

FOLLOWS ADVANCE IN PIG IRON PRICES.

Large Production of Blast Furnaces for April.—Higher Prices for Engines.—Coke, Bar Iron and Scrap Weak.

Sharp advances on quotations of pig iron announced last week have been followed by much activity in nearly all buying centers. Although actual transactions in the central west have probably not been so numerous as in the preceding week, there was heavy inquiry and the failure of buying was often due to inability of consumers to obtain the desired iron even at recent high quotations. In the east, the market is decidedly stronger than it was a week ago, the buying of basic being a prominent feature. Throughout the country it is becoming more clearly apparent that American production for the last half of the year will fall considerably short of the demand, and many consumers are looking to foreign iron for relief. The only available stocks of iron of any size in the world are in England, and they are being reduced rapidly. Prices of Middlesboro iron have passed 60 shillings, and further advances are expected. The price of Middlesboro No. 3 at tidewater is $22.50 to $23 for small lots and $21 for large tonnages. For delivery at Cleveland, the price has been advanced from $24.50 last week to $26.

Iron Ore Shipments

Ore shipments from Lake Superior mines for April were 630,975 tons, compared with 1,447,386 tons in April, 1906, the decreased movement being due to the extremely cold weather. The ore on docks at lower lake ports on May 1 was 1,930,088 tons, or about 200,000 tons more than in May, 1906. It is expected that the shipments of May will exceed those of the same month last year, when the dock strike was in progress.

Blast Furnace Production

Our monthly statistics of pig iron production show an output of 2,191,535 tons for April, an increase of about 5,000 tons over March. In view of the frequent blowing out of stacks for repairs, this showing is surprisingly favorable, and indicates that repairs are being made in the shortest possible time.

Scarcity of Crude Steel

The scarcity of crude steel continues, especially in the Pittsburg district, and several of the large independent interests have sold most of their estimated product for the year. Manufacturers who have not covered for their requirements will probably have difficulty in doing so.

Higher Prices for Engines

Owing to the continued advances in prices of materials, particularly on account of the high quotations on pig iron, which are likely to advance still further, manufacturers of all kinds of engines have either advanced their prices or will do so at an early date. Similar advances in prices of machine tools and machinery are to be expected.

Coke and Bar Iron Weak

Coke prices continue low and the weakness of the market is somewhat difficult to explain in view of the activity of blast furnaces and foundries. Scrap is weak in most centers and bar iron is selling at lower prices.

Delivery of Sheets

Although no large orders for rails for 1908 delivery have yet been received, the companies are figuring on tonnages fully as large as those of this year, and orders are expected to come in freely at a not far distant date. New business in sheets is not so heavy at present on account of the inability of consumers to estimate their requirements in advance of the time for which deliveries are now promised, which is about six months. Shipments of the principal producer for April exceeded the previous monthly record by 14,000 tons.

TROOPS CALLED

To Do Strike Duty in Pittsburg District.—Labor News.

For the first time since the great strike at the Homestead steel works, fifteen years ago, the Pennsylvania state constabulary has been called upon to do strike duty in the Pittsburg district. The present strike of machinists, affecting practically every machine shop in Pittsburg, has resulted in a few disturbances, but on Sunday afternoon of this week a detachment of Troop A, state constabulary, was called from Greensburg to guard the plant of the Mesta Machine Co., at West Homestead, near Pittsburg. The Mesta Machine Co., which belongs to the Manufacturers' Association, and the National Metal Trades Association, is receiving assistance from these organizations and men to replace the strikers are being put to work. Other plants tied up by the machinists' strike are Frank-Kneeland and McGill plants of the United Engineering & Foundry Co., Mackintosh-Hemphill & Co., Fawcus Machine Co., Heyl & Patterson, Geo. A. Hogg Iron & Steel Co., Baird & Gazzum Machine Co., Pittsburg Machine Tool Co., Wilson-Snyder Co., and the Pressed Steel Car Co.

HEAVY EASTERN SALES.

(Special Telegram.

New York, May 7.—Several heavy sales of foundry and basic iron were made yesterday and the market is increasingly firm though without excitement. Little iron is available for early delivery and some large tonnages have been refused by producers. Foreign iron to arrive during next six or eight weeks is practically all sold. Number three Middlesboro closed yesterday at sixty-one shillings.

Rail sales of the week include 10,000 tons to the St. Louis & San Francisco, 3,300 to an industrial railroad, 2,000 tons for export to Cuba, and scattered lots aggregating about 7,000 tons additional.

THE WEEK IN IRON CENTERS.

PITTSBURG.

Lower Prices on Bar Iron, Coke and Scrap.—Pig Iron is Firm.

Office of THE IRON TRADE REVIEW.
521 Park Bldg., May 8.

Although there has been no indication of weakness in either market conditions or prices in the leading lines of finished material during the past week, activities were not so great in the Pittsburg district as they were for the two previous weeks. From this it is taken that consumers have covered for their requirements to a very large extent and those who have not done so are waiting for further developments before they enter the market. Bar iron, coke and scrap prices are the only ones showing a decline, the first on account of offerings by small merchant mills which have taken on business at a price about $2 under that ruling for the past three months. For delivery in the Pittsburg district a fair tonnage of bar iron has been sold at the 1.70c Pittsburg base. Coke prices have been weak for the past month or six weeks and show an inclination to go still lower. The tendency of scrap prices is hard to determine in connection with the high price of pig metal. The offerings of steel scrap by producers have been only fair while consumers on the other hand apparently have all they need and are showing no anxiety to come into the market at this time. In finished lines, for anything like prompt delivery, official prices can no longer be taken as a criterion and on plates and steel bars for shipment within the next six weeks an advance of from $1 to $2 is noted over the official schedule. Not a great deal of premium business is being taken on, as a majority of mills are filled to capacity on contract business and only those which have not contracted for their output for any considerable period are in position to take advantage of the situation which makes premiums possible. The scarcity of steel billets, slabs and sheet bars still continues to be the strong feature of the situation and while there is considerable talk to the effect that some of the independent manufacturers who have not already covered will be unable to do so, a canvass of these manufacturers shows that they are covered more fully than is generally understood in spite of the fact that a large volume of business is being peddled around by those seeking to place it for last half delivery. During the past week the American Sheet & Tin Plate Co. had in operation 100 per cent of its sheet capacity and its April shipments exceeded all previous shipment records by 14,000 tons, although its production record was not a record breaker, January exceeding it by a few thousand tons.

Pig Iron.—The movement of the pig iron market during the past two weeks has been rather slow, due probably to the large previous buying and the fact that consumers are pretty well covered for their requirements through the third quarter. We report the sale of 7,500 tons basic and 6,000 tons Bessemer at $23.05 valley furnace, this going to Sharon, Pa. Another sale of 5,000 tons, same delivery, and same price, is also reported. The Allegheny Steel Co. bought a round tonnage of basic for fourth quarter delivery at $22.25 valley furnace. Spot Bessemer iron is quoted $23.50 to $24, valley furnace, and last half at $23 valley furnace. Prompt northern No. 2 foundry iron is quoted nominally at $25 valley and $23 for last half delivery. Southern furnaces are holding very strong at the prices established last week, one large interest quoting $20 Birmingham and another $19 Birmingham, both for last half deliveries with no offerings for third quarter. On last half delivery we quote as follows:

Bessemer, Valley	$ 23.00
Bessemer, Pittsburg	23.85
No. 1 Foundry, Pittsburg	23.85 to 24.35
No. 2 Foundry, Pittsburg	23.85
Gray Forge, Pittsburg	22.35 to 22.85
Basic, Valley	22.50 to 23.00
Basic, Pittsburg	23.35 to 23.85

Ferro-Manganese.—This market is quiet, probably due to the prevailing low quotations for last half delivery, the consumers anticipating a further decline. Prompt ferro-manganese foreign 80 per cent is quoted $70 Pittsburg and for last half $66 to $67. Imported 50 per cent ferro-silicon is quoted $110 Pittsburg; domestic 12 per cent, $36; 11 per cent, $35; 10 per cent, $34; with the lower grades imported ferro-silicon, $1 higher.

Steel.—With the announcement of at least three of the large independent steel producers that they have already sold their surplus for the greater part of last half or will need their entire output for their own finishing mills, the steel situation has tightened up even more than was noted last week. One independent producer, on account of the shut down for repairs in one of its finishing departments, sold about 11,000 tons in the open market at about $1 under current quotations. There is considerable business being offered to the mills, but most of it has been turned aside with refusal to quote on account of reasons given above. There are at least quite a few of the smaller sheet and tin plate interests not fully covered for third and fourth quarter and their predicament has become serious. For both prompt and last half deliveries, we quote nominal market at $30.50 Pittsburg on Bessemer and $32 to $32.50 on open hearth.

Muck Bar.—We continue to quote a nominal market at $37.50 to $38 Pittsburg on all pig metal bar and $36.75 to $37 on part scrap bar.

Plates.—The official card price of the leading interest is no longer a criterion of the market, although it is being quoted on future business, and we now quote 1.80c to 1.90c on tank plate ¼ inch thick, 6¼ to 100 inches f. o. b. mill Pittsburg with the usual extras. For shipment out of stocks jobbers are securing from 1.90c to 2c on shipments from three to six weeks and eastern mills in position to quote for reasonably prompt delivery are securing from 1.85c to 1.95c. We quote as follows:

Tank plate, ¼-inch thick, 6¼ to 100 inches, 1.80c to 1.90c f. o. b. mill Pittsburg. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c. A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than four inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1.00c. Gages under ¼-inch to and including 3-16-inch plate on thin edges, 0.10c; under 3-16 to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—During the past week the leading interest has had in operation 100 per cent of its sheet mills and the total shipments for April exceeded previous shipment records by 14,000 tons, over the best previous month in the history of the company. The demand for sheets on new business has been light due to the fact that there are very few interests which have not covered. There is a good demand for galvanized corrugated roofing. Independent mills which do not make a practice of covering very far ahead on contracts are consequently in shape to give reasonably prompt delivery and are securing about $2 per ton premium. There has been some improvement in delivery promises on light black sheets

and on other lines promises have not been extended, manufacturers keeping about even. Official prices are unchanged as follows:

Black steel sheets one pass, cold rolled, Nos. 11-12, 2.20c; Nos. 13-14, 2.25c; Nos. 15-16, 2.30c; Nos. 17-21, 2.35c; Nos. 22-24, 2.40c; Nos. 25-26, 2.45c; No. 27, 2.50c; No. 28, 2.60c; No. 29, 2.75c; No. 30, 2.85c; galvanized, Nos. 10-11, 2.65c; Nos. 12-14, 2.75c; Nos. 15-16, 2.85c; Nos. 17-21, 3.00c; Nos. 22-24, 3.15c; Nos. 25-26, 3.35c; No. 27, 3.55c; No. 28, 3.75c; No. 29, 4.00c; No. 30, 4.25c. Corrugated roofing, $1.85 per square for No. 28 painted, 2½-inch corrugation, and $3.25 per square No. 28.

Tin Plate.—The leading interest now has in operation 235 of its 248 tin mills, the only two off being the Anderson and Humbert plants with 13 mills between them. New tin plate business is being taken on all the time but in no large tonnages. Official prices are as follows:

Coke tin plate 100-pound basis, 14 x 20, $3.90 f. o. b. mill, Pittsburg district. Terms, 30 days, less two per cent for cash in ten days.

Rails and Track Material.—The Savannah, Augusta & Northern railway during the past week closed with the Carnegie Steel Co. for 46,000 tons standard rails for 1907 delivery. The fact that this is the exact tonnage closed by the Louisville & Nashville R. R. with the Tennessee Coal, Iron & R. R. Co. for 1908 delivery is merely a coincidence, the L. & N. deal being for open-hearth rails at $30, while the order placed this week is for Bessemer rails at $28. No new 1908 business has been announced. Northern mills still have about two months' capacity open for 1907. The demand for light rails has been fair and the total tonnage of both light and standard sections for the week under review has been very close to 50,000 tons. We quote as follows:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 50 tons, $30; less than carload lots, $32; 8-pound, $40; 12-pound, $36 to $37; 16-pound, $35 to $36; 20-pound, $34 to $35; 25 to 45-pound, $33 to $34; angle splice bars for standard sections, $1.65; spikes for forward deliveries, $2.50.

Hoops, Bands and Cotton Ties.—The steady current of specifications for hoops and bands continues and mills have not been able to reduce the volume of business on their order books to any material extent, although the new business on yearly contracts has not been very heavy. The sale of cotton ties in the south has not yet reached 1,000,000 bundles, although distribution is well under way. The official price is 95 cents per bundle with an advance of ½ cent per bundle per month after May 24. We quote as follows:

Hoops in carload lots, 2c; in less than carload lots, 2.10c; bands, 1.60c; base half extras as per standard steel.

Merchant Bars.—Another decline in the market price of bar iron is noted this week and 1.70c base Pittsburg can be done without much difficulty and 1.60c base Pittsburg plus freight to point of delivery on western shipments can probably be shaded. The market on steel bars is extremely strong with comparatively little new business. A few of the smaller agricultural interests have come into the market and bought, but the larger interests are not expected much before July 1. We quote as follows:

Common iron bars, 1.70c to 1.75c Pittsburg in carload lots and over; 1.75c to 1.80c in less than carloads; Bessemer steel bars, 1.60c, net; plow and cultivator, 1.60c, net; channels, angles, zees, tees, under three inches, 1.70c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 50 per cent off in carload lots, and 5 per cent off in less than carloads, delivered in base territory; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flats, 1.60c to 1.65c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.10c to 2.15c. The price of planished and machine straightened tire is 1.80c, base, half tire extras. Iron finished tire up to 1½ inch and over to be sold on regular bar basis of 1.60c base, half extras, steel card.

Structural Material.—During the past week the Brown-Ketcham Iron Works, of Indianapolis, secured the contract for 4,500 tons material for the Corn Exchange Bank, of Chicago and Riter-Conley & Co., of Pittsburg, secured a contract for 2,000 tons of riveted pipe for the Boulder, Colorado, power plant. Tenders are now out for a 1,200-ton building at Seventh and Liberty streets, Pittsburg. Some of the smaller construction companies are not as filled up as the larger ones, and are taking on considerable low priced business. The current inquiry aggregates a large tonnage, but the individual inquiries are not large. Mills are in better shape to make shipments on structural material than in any of the other finished lines.

Beams and channels, 15-inch, and under, 1.70c; over 15 inches, 1.80c; zees, 1.70c; tees, 1.70c; angles from three to six inches inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.70c base.

Wire and Wire Nails.—This situation, on account of the congested condition of producers, is not susceptible to any great change inasmuch, as order books are filled to the maximum mill output for the full contract period and practically all contracts fully specified. We continue to quote the following nominal prices:

Wire nails, jobbers' carload lots, $2; retailers' carload lots, $2.05; less than carloads, $2.10; painted barb wire, $2.15, for jobbers in carloads; retailers in carloads, $2.20; and less than carload, $2.30, with 30c for galvanizing; plain wire, $1.85 for jobbers, and $1.90 by carload.

Merchant Pipe.—Spang, Chalfant & Co. has taken on 55 miles of 16-inch line pipe for delivery in Indian Territory. There is an inquiry in the market for 20 miles of 12-inch pipe for July and August delivery, but, as far as can be learned, it has not been placed, one independent mill having declined to figure on it on account of delivery requirements. The Philadelphia Co., of Pittsburg, is also in the market for a fair sized tonnage of line pipe. The only card out on steel merchant pipe is that of the Youngstown Sheet & Tube Co. quoting 72 on black and 62 on galvanized ¾ inch to 6 inch, base sizes to consumers. We quote the following nominal discounts, base sizes, random lengths, with threads and couplings:

	—Steel—	
	black.	galv.
⅛ to ¼ inch	64	48
⅜ inch	66	52
½ inch	68	56
¾ to 6 inches	72	62
7 to 12 inches	67	52
EXTRA STRONG PLAIN ENDS.		
⅛ to ¼ inch	57	45
⅜ to 4 inches	64	52
4½ to 8 inches	60	48
Double extra strong plain ends, ½ to 8 inches	53	42

Iron Pipe.—A. M. Byers & Co., under date of May 1, has issued a new card on iron pipe with jobbers' discounts 65 on ¾ to 6 inch black and 55 on ¾ to 6 inch on galvanized in carload lots.

IRON PIPE.

CUT 6 FEET AND LONGER, CARLOAD LOTS.

	Blk.	Gal.
⅛, ¼, and ⅜ inch	56	40
½ inch	59	48
¾ to 6 inch	64	54
7 and 8 inch	59	43
EXTRA STRONG PLAIN ENDS.		
⅛, ¼, and ⅜ inch	52	40
½ to 4 inch, inclusive	59	47
4½ to 8 inch	55	42
DOUBLE EXTRA HEAVY PLAIN ENDS.		
½ to 3 inch, inclusive	48	37

Boiler Tubes.—The new demand for boiler tubes is unusually heavy and while the old card discounts are still in effect, premiums from $1 to $2 are being secured for reasonably prompt delivery. The new business is heavy for both locomotive and merchant tubes.

	Iron.	Steel.
1 to 1½ inch	41	47
1¾ to 2¼ inch	42	59
2½ inch	47	61
2¾ to 5 inch	52	65
6 to 13 inch	42	59

Coke.—The coke market is still off. While a few of the furnaces to which coke shipments have been sus-

pended have resumed operations and are again taking their shipments, others have blown out for repairs or relining and put things back to about where they were. Many of the smaller operators in the region are stocking their coke or operating only three to five days a week, but there is still a great deal of spot coke, both furnace and foundry in the market. Spot furnace coke is quoted $2.25 to $2.35, at the ovens and for last half shipments $2.50 to $2.60 is quoted. Spot foundry coke is offered at $3.15 to $3.25 for the standard grades although washed foundry coke is offered as low as $2.75.

Old Material.—Consumers of scrap seem to be able to get what material they want without any great difficulty and apparently are pretty comfortably filled for their requirements. Big consumers are reducing their idea of price and are not anxious to negotiate for material at this time. Borings and cast scrap are fairly strong and in good demand. Turnings are inclined to go off a little in price and wrought scrap is exceedingly low. Taken altogether it is a very hard trading market. For deliveries in the Pittsburg district we quote as follows:

Heavy melting scrap, $18 to $18.25; re-rolling rails, $19 to $19.50; bundled sheet scrap, $16 to $16.50; iron axles, $30.50 to $31; old iron rails, $23 to $23.50; No. 1 wrought scrap, $19 to $19.25; old car wheels, $24.50 to $25; low phosphorus scrap, $22.50 to $23; machine shop turnings, $15.25 to $15.75; axle turnings, $16.25 to $16.50; cast borings, $13.25 to $13.75; No. 1 cast scrap, $20.75 to $21.50.

CHICAGO.

Further Advances in Pig Iron Prices Check Buying.—Some Resale Iron.

Office of THE IRON TRADE REVIEW.
1362 Monadnock Block, May 7.

A disquieting note in the present upward movement of pig iron is evidenced in the increasing tonnage of resale metal offered by local foundrymen. Several hundred tons for immediate shipment were sold a few days ago at less than current spot prices, and an offer to sell 3,000 tons has come from another melter. This adverse influence has had no immediate effect on the market prices having advanced from 50 cents to $1.50 a ton for Alabama iron, and from $1 to $2 a ton for Virginia grades in the week under review with demand continuing in healthy volume. No purchases of southern iron for the last half have been made by the International Harvester Co., despite reports to the contrary. This interest is amply protected on northern foundry and malleable Bessemer for that period, however, having placed orders for these grades in the past few months for approximately 30,000 tons. The stocks of iron in the company's various yards as a result of its spot and foreign purchases have been heavily augmented recently by large shipments of the delinquent tonnage due from southern furnaces, and authority is had for the statement that the company will not enter the market for further tonnage for at least three months to come. The only changes in finished material affect bale ties and merchant pipe. The former has advanced 5 per cent. Merchant pipe from local stocks is now on the basis of 68 per cent for steel, and 63 per cent for iron. Rail tonnage for 1908 rolling is slow in developing. Only three inquiries from western roads aggregating 65,000 tons have been received in the past week. Contracting for cast iron pipe is active and two unusually large inquiries for riveted pipe are before makers. Demand for plates, sheets, structural shapes and wire materials is without cessation. Scrap and coke are quiet, and each is inclined to weakness.

Pig Iron.—Sales of foundry irons for second half deliveries have been numerous in the past week. For a few days, there was quite a flurry of orders, and in the excitement prevailing southern sellers availed themselves of the opportunity to move their prices to higher levels. Following so quickly upon the advances noted a week ago, the second raise dampened the ardor of many buyers, and the number of orders has perceptibly decreased. The last advance was not uniform, but varied according to the individual views of the seller. Virginia furnaces are now asking $28.10, Chicago, for No. 2 foundry for May and June shipment; $26.10 for the third quarter, and $25.10 for the fourth quarter. This represents an advance of $2 a ton for the second and third quarters, and $1 for the fourth quarter. On Birmingham iron, the minimum quotation now offered for third quarter deliveries is $21 furnace for No. 2, or $25.35 Chicago; and for the fourth quarter, $19.50 Birmingham for No. 2, or $23.85 Chicago. For the latter delivery, one important southern interest is firm at a minimum of $20 Birmingham for No. 2 foundry. The advance on third quarter requirements is $1.50 a ton over the previous week's quotations, or a total advance of $2.50 a ton in less than three weeks. No "split" quotation is made on full second-half contracts, each quarter's requirements being charged on the basis of the above schedules. No change has developed in northern irons, the local range of prices for last half deliveries being $24.50 to $25 Chicago for No. 2 foundry. Spot northern is scarce and firm at $27 to $28 Chicago for No. 2. Southern spot iron is more plentiful, and, because of the decreasing demand, prices have again receded 50 cents a ton, or to the basis of $22.50 Birmingham for No. 2. Iron for June shipment is held on the basis of $22 furnace. Virginia and Alabama furnaces have withdrawn all quotations on basic iron for the last half, and an inquiry for 3,000 tons from a local melter for that delivery could not be placed in this market. A small tonnage of Birmingham basic for May and June shipment is held by a local seller at $22 furnace, or $26.35 Chicago. Producers of high silicon irons have revised their schedules, and 4 per cent to 6 per cent southern silvery for spot shipment is firmly maintained at $24.50 to $25 Birmingham; and for the third quarter at $23 Birmingham. Jackson county 8 per cent to 10 per cent for spot shipment is offered at $30 furnace; but for deliveries extending between August and December, contracts can be placed at the prices given below. Inquiry is brisk for charcoal iron, standard and malleable Bessemer. Immediate deliveries of either are hard to obtain. We have revised our prices, and quote for the last half as follows: The minimum quotation is for the fourth quarter; the maximum for the third quarter.

Lake Superior charcoal	$26.50 to 27.00
Northern Foundry No. 1	25.00 to 25.50
Northern Foundry No. 2	24.50 to 25.00
Northern Foundry No. 3	24.00 to 24.50
Northern Scotch Foundry	25.00 to 25.50
Ohio Strong Softeners No. 1	24.30 to 24.80
Ohio Strong Softeners No. 2	23.80 to 24.30
Southern Foundry No. 1	24.35 to 25.85
Southern Foundry No. 2	23.85 to 25.35
Southern Foundry No. 3	23.35 to 24.85
Southern Foundry No. 4	22.85 to 24.35
Southern No. 1 Soft	24.35 to 25.85
Southern No. 2 Soft	23.85 to 25.35
Southern Gray Forge	22.35 to 23.85
Southern Mottled	22.10 to 23.75
Southern Silveries, 4 per cent to 6 per cent Silicon	26.35 to 27.35
Jackson Co. Silveries, 6 per cent.	29.40 to 29.90
Jackson Co. Silveries, 8 per cent.	30.40 to 30.90
Jackson Co. Silveries, 10 per cent	31.40 to 31.90
Malleable Bessemer	24.50 to 25.00

Billets and Rods.—No transactions of moment in either product have been closed in the week under review. Only one local mill is accepting additional billet tonnage, and this is restricted to small lots to its regular trade. For these it is asking on the basis of $36 to $38 Chicago, according to the requirements of the buyer. Wire rods are without life, principally because there is little tonnage available. The quotation on these of $37 to $39 Pittsburg is merely nominal. The Illinois Steel Co. is hard pressed to meet its own requirements in crude steel and may be a buyer before the end of the year.

Iron and Steel Bars.—The uncertainty of the crop outlook is evidenced in the cautiousness of implement interests in making purchases of steel bars for consumption in the coming fiscal year. While contracts covering these requirements continue to be placed, and the tonnage thus far booked for that delivery is of satisfactory proportions, the business is not coming in freely. The orders placed to date are largely from heavy consumers, whose minimum wants are known in advance; the rank and file of the implement trade seems disposed to wait until the crop prospects are more clearly outlined before definitely deciding on their tonnage requirements. Specifications, however, continue to full contract quotas. There is no change in bar iron, quotations ranging from 1.60c to 1.65c Pittsburg. The minimum price is obtainable only on desirable tonnage. New business in this product is of fair proportions and specifications are active. We quote as follows:

Soft steel bars and bands, 1.76½c, half extras; soft steel angles, less than 3 x 3, 1.86½c; hoops, 2.16½c base, full extras. We quote bar iron from stock 2.25c, full extras; soft steel rounds and squares, 3 inches and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by ⅛ inch and larger, $2 per 100 pounds base; 4½ inches x 5 inches and 6 inches x 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half rounds, $2 per 100 pounds base; steel bands $2, half extras; soft steel hoops, 2.40c to 2.50c full extras. Other sizes not mentioned above, $2 per 100 pounds base plus half extras.

Plates.—Independent producers and jobbers of plates are feeling the full brunt of the extraordinary demand for this material. The Steel Corporation is heavily oversold and is out of the market for the balance of the year. Those interests in position to make prompt mill shipments are getting 2c Pittsburg for same, and 1.80c Pittsburg for later deliveries, but even at these prices the demand cannot be supplied. Only on orders for shipment in the last half, can 1.70c Pittsburg be done. Warehouse quotations are exceedingly firm, and are liable to change any day owing to the difficulty of maintaining a full line of stocks. We quote as follows:

Plates ¼ inch and thicker 6⅛ to 100 inches wide, either universal or sheared, 1.70c to 2c Pittsburg base. For extras see Pittsburg report. Freight rate to Chicago, 16½c per 100 pounds. Jobbers' prices for shipment from local stocks are as follows: Tank steel ¼ inch and heavier up to 72 inches wide, 2.20c; 3-16 inch up to and including 60 inches wide, 2.30c; 3-16 inch 72 inches wide, 2.55c; No. 8 up to 60 inches wide, 2.35c. Flange steel, 25c extra; heads, 25c extra.

Sheets.—The question of delivery has become paramount to that of price, and sales at a premium above "official" quotations, are of frequent occurence. New business is of good volume, and specifications are in one unending stream. Our quotations below are subject to the above reservation. We quote:

Black sheets Nos. 8, 9 and 10, 1.90c Pittsburg; No. 28, 2.60c Pittsburg. Galvanized sheets No. 28, 3.75c Pittsburg. Freight to Chicago 16½ per 100 pounds. Jobbers' prices on carload lots or less from store are as follows: No. 10, 2.50c to 2.55c; No. 12, 2.55c to 2.60c; No. 14, 2.60c to 2.65c; No. 16 2.65c to 2.70c; Nos. 18-20, 2.80c to 2.90c; Nos. 22-24, 2.85c to 2.95c; No. 26, 2.90c to 3c; No. 27, 2.95c to 3.05c; No. 28, 3.05c to 3.15c; No. 30, 3.35c to 3.45c. Galvanized sheets, No. 10 to 20, 3.50c to 3.55c; Nos. 22 and 24, 3.65c to 3.75c; No. 26, 3.85c to 3.90c; No. 27, 4.05c to 4.15c; No. 28, 4.25c to 4.35c; No. 30, 5.40c to 5.45c.

Structural Steel.—A round tonnage of steel for small buildings has been placed with fabricators, but no contracts involving large enterprises have been let in the current week. The only railroad inquiry pending in this market is for 5,000 tons of fabricated shapes. The movement of material from mills and stores continues steady, specifications and new commitments being gratifyingly large. Each week sees a lengthening of the delivery period. Prices are without change as follows:

Beams and channels, 3 to 15 inches inclusive, 1.70c Pittsburg. For extras see Pittsburg report. Freight rate from that city to Chicago is 16½c per 100 pounds. Quotations from stores are as follows:

All angles, three inches and larger, including six inches, $2.05 to $2.10 per 100 pounds; angles over six inches, $2.15 per 100 pounds base, beams, three inches to 15 inches, inclusive, $2.05 to $2.10 per 100 pounds base; channels, three inches and larger, $2.05 per 100 pounds base. Less than carload lots are $1 a ton higher than foregoing prices.

Rails and Track Supplies.—The reluctance of railroads, noted a week ago, to make either engagements or reservations for 1908 rollings continues in evidence. Only one contract for 1,000 tons has been placed with the local mill since our last report, and but three additional inquiries for 1908 shipment have been received. These are from western roads. One is for 50,000 tons; another for 10,000 tons, and the third for 5,000 tons. There is an inquiry pending for 4,000 tons for 1907 shipment, and a tentative offer of a round tonnage for this year's delivery from a western trunk line, if the shipment can be made. A brisk demand for track supplies for this year's shipment prevails, but on spikes the Illinois Steel Co. is out of the market. No inquiry is felt for 1908 requirements. Light rails are quiet. Prices are without change as follows:

Bessemer rails, $28 to $30; less than 500-ton lots, $32; open-hearth rails, $29; light rails, Bessemer, 30 to 45-pound sections, $35; 25-pound, $36; 20-pound, $37; 16-pound, $38; 12-pound, $39, and lighter sections down to 8-pound, $45.50, all f. o. b. mill. Track supplies vary in price according to quantity and delivery. On orders accompanying rail contracts for future delivery, we quote angle bars, 1.65c; spikes, 2.35c; bolts with square nuts, 2.65c; with hexagon nuts, 2.80c. For carload lots or less, for prompt shipment, the following prices are asked: Angle bars, 2.25c to 2.75c; spikes, 2.60c to 2.70c; bolts with square nuts, 2.85c; with hexagon nuts, 3c.

Merchant Steel.—Distribution on old contracts is at the maximum capacity of mills. New tonnage is developing slowly, owing to the unfavorable reports current. Prices are without change as follows:

Planished or smooth finished tire steel, 1.96½c; iron finish, up to 1½ x ½ inch, 1.91½c base; iron finish, 1½ x ½ inch and larger, 1.76½c base; channels for solid rubber tires, ¾ to 1 inch, 2.26½c, and 1⅛ inch and larger, 2.16½c; smooth finished machinery steel, 2.16½c; flat sleigh shoe, 1.81½c; concave and convex sleigh shoe, 2.06½c; cutter shoe, 2.35c; toe calk steel, 2.31½c; railway spring, 1.96½c; crucible tool steel, 6½c to 8c, with higher prices asked on special grades. Shafting is very strong. Quotations are without change at 50 per cent off in car lots and 45 per cent in less than car lots in base territory.

Cast Iron Pipe.—There is an active demand for cast iron pipe from central western municipalities, and several contracts for round tonnages are pending. Among the orders taken this week by the United States Cast Iron Pipe & Foundry Co. are the following: 6,000 tons for St. Louis; 2,500 tons Cincinnati, and approximately 3,000 tons for the Union Gas Co., Cincinnati. Columbus, Ohio, will let its contract for 600 tons on the 9th of this month. Prices are without change, as follows: Four-inch water pipe, $38.60; six to 12-inch inclusive, $37.60; 16-inch and upward, $36.60; gas pipe, $1 a ton higher.

Merchant Pipe and Boiler Tubes.—Slow progress is made by the leading producer in overtaking its delinquent tonnage. New business is daily placed for delivery in the second half of the year, price and shipment to be determined after June 1. Two large inquiries for riveted pipe for Idaho and Colorado

consumption have been received in the past week. One is for 14 miles of No. 8 iron pipe, 30-inch diameter, from the Telluride Power Co., Grace, Ida., and the other for 38,000 tons of riveted pipe, 84½-inch diameter, 1⅛ inch thick, for the Colorado Consolidated Power Co., Boulder, Colo. The prospects of closing either are remote at the present time. The new steel pipe schedule of the Youngstown Sheet & Tube Co. represents an advance of $2 a ton, the discount on ¾ to 6-inch base sizes being 72 on black and 62 on galvanized.

Store inquiry for pipe and tubes is very active. Prices are exceedingly strong, and on merchant pipe a new schedule has been issued. This is as follows: Black steel, ⅛ inch to ¼ inch, 60 per cent; ⅜ inch, 62 per cent; ½ inch, 64 per cent; ¾ inch to 6 inches, 68 per cent; 7 to 12 inches, 63 per cent. Galvanized steel pipe, ⅛ inch to ¼ inch, 44 per cent; ⅜ inch, 48 per cent; ½ inch, 52 per cent; ¾ to 6 inches, 58 per cent; 7 to 12 inches, 48 per cent. There is no schedule on iron pipe, though the ruling quotation on ¾ to 6 inches, is 63 per cent off the list. Boiler tubes are without change, store prices being as follows: 4 inch steel, 60 off the list; 4 inch iron, 47½ off and 4 inch seamless, 42½ off.

Wire Products.—The American Steel & Wire Co. announces a new schedule of prices on bale ties, representing an advance of 5 per cent. Revised quotations to jobbers are 85 per cent off for carload lots, and 82½ per cent and 10 per cent off for carload lots to retailers. A slight cessation is noted in the demand for nails and fencing, and though it is a seasonable reduction, the let-up is welcomed. The pressure for deliveries is unremitting, slow progress being reported in overtaking the delinquent tonnage. We quote as follows: Wire nails, $2.15; painted barb wire, $2.30; galvanized barb wire, $2.60; smooth annealed wire, $2.30; polished staples, $2.55. Carload lots to retailers, five cents higher; less than carload lots, 15 cents higher.

Coke.—Demand for Connellsville foundry coke is not of active proportions. In view of the soft condition of the market, consumers are not disposed to contract very far ahead, and only a normal tonnage is being booked. Prices for the last half have receded to a minimum of $3.25 ovens. Spot inquiry is infinitesimal. Contracting for forward requirements in Solvay coke is good. The average price at which new business is being taken is $6.50 Chicago.

Old Material.—A feeling of uneasiness has crept into the local situation, and neither buyers nor sellers appear anxious to disturb the market with their offerings. As a result, prices are uncertain and trading is at a minimum. Aside from Pittsburg, inquiry for heavy melting stock, railroad malleable has been the most active locally. There is a brisk demand for this product, but $16 is the maximum price offered. In sympathy with the improved movement in pig iron, stove plate has declined to $14.50, and No. 1 cast to $18, sales having been made at these figures. Melting steel rails, and frogs, switches and guards (cut apart) have changed hands in the current week at prices ranging from $17.50 to $17.75. Pipes and flues have sold at $12. Railroad offerings this week aggregate 10,500 tons, divided as follows: B. & O., 4,500; Santa Fe, 4,000 tons; Rock Island, 1,600 tons; Chicago & Eastern Illinois, 650 tons. The B. & O. list closes May 11, and the Santa Fe May 7th. In the former are 2,187 tons of steel rails, 6 feet and over; 625 tons of No. 1 wrought, and 440 tons of No. 1 cast. The principal item in the Santa Fe list is 680 tons of No. 1 wrought. We have revised our prices, and quote as follows, gross tons being given in the first paragraph:

Old Steel Rails (less than 3 feet)	$17.50 to 18.00
Old Car Wheels	25.00 to 25.25
Old Iron Rails	24.50 to 25.00
Rerolling Rails (3 feet and over)	18.50 to 19.00
Light Section Relayers, 45 lbs. and under, subject to inspection	30.00 to 32.00
Relaying Rails, subject to inspection	28.00 to 30.00
Frogs, Switches and Guards	16.50 to 17.00
Heavy Melting Steel	15.50 to 16.00
Mixed Country Steel	12.50 to 13.00

We quote net tons as follows:

No. 1 R. R. Wrought	$15.25 to 15.50
No. 2 R. R. Wrought	14.25 to 14.50
Shafting	17.00 to 17.50
Dealers Forge No. 1	12.50 to 13.00
Pipes and Flues	12.00 to 12.50
No. 1 Cast, 150 lbs. and less	18.00 to 18.50
No. 1 Mill	10.00 to 10.50
Mixed Busheling (No. 1 & No. 2)	11.00 to 11.50
Country Sheet	8.50 to 9.00
No. 1 Boilers Cut	11.50 to 12.00
Boiler Punchings	14.75 to 15.25
Cast Borings	9.50 to 10.00
Mixed Borings, etc	9.50 to 10.00
Machine Shop Turnings	11.50 to 12.00
Railroad Malleable	15.75 to 16.25
Agricultural Malleable	14.75 to 15.25
Stove Plate and Light Cast Scrap	14.50 to 15.00
Old Iron Splice Bars	18.50 to 19.00

Theodore Geissman & Co., direct mill representatives for the sale of iron and steel shapes, wire and kindred lines, announce the removal of their offices from 115 Dearborn street, Chicago, to larger quarters in the Commercial National Bank building.

CLEVELAND.

Malleable for Next Year Sold.—Pig Iron Market Very Strong.

Office of THE IRON TRADE REVIEW.
Browning Building, May 7.

Iron Ore.—As was expected, ore shipments from Lake Superior mines for April showed a heavy decrease, compared with the same month of 1906. Last month the shipments were 630,975 tons, compared with 1,447,386 tons in April, 1906. There was a fair movement from Escanaba, but all of the Lake Superior ports made decreased shipments. Last May a large number of vessels were tied up on account of the dock strike, and it is confidently believed that the shipments this month will exceed those of May, 1906. The ore on dock at lower lake ports May 1 was 1,930,088 tons, or about 200,000 more than on May 1, 1906. Within a few days, ore shippers have chartered vessel capacity for the season to carry about a million tons of ore. It is probable that more chartering will soon be done. It is expected that the demand for vessel tonnage to carry grain will be much heavier this year than it was last. The shipments of ore by ports last month were as follows:

Port	Apr. 06	Percentage of Total	Apr. 07	Percentage of Total
Escanaba	243,254	16.81	291,823	46.25
Marquette	85,216	5.89	10,047	1.59
Ashland	134,302	9.28	15,220	2.42
Superior	210,263	14.53	106,678	16.91
Duluth	383.643	26.50	101,909	16.15
Two Harbors	390,708	26.99	105,248	16.68
	1,447,386	100.00	630,975	100.00

Pig Iron.—Following the sharp advance in quotations last week, the market is exceedingly strong, sales being in good volume; inquiry heavy and prices still tending upward. The minimum quotation on basic, Bessemer, malleable and No. 2 foundry for last half is now $23, and the supply is very limited. One foundryman who sent out an inquiry for 1,000 tons for last half, is having considerable difficulty in placing the order, and the best quotation that could be made to him for third quarter by one agency was $25 at the furnace, as the available supply for third quarter is exceedingly limited. Some furnaces have a fair tonnage for fourth quarter. A round tonnage of malleable was purchased in the Cleveland district this week for delivery through the first six months of 1908. The price is not announced, but the usual asking price on malleable and No. 2 foundry for the first quarter of 1908 is $22. For delivery in Cleveland for the last half we quote $23.50 at the furnace, or $23.75 delivered at the foundry for No. 2. The price of foreign iron has been advanced from $24.50 last week for No. 3 Middlesboro to $26, delivered in Cleveland. A round tonnage of basic for spot delivery was sold this week at $24. Inquiries for basic for the last half are numerous, but sales few. We quote, f. o. b. Cleveland for last half delivery, as follows:

Bessemer	$23.90
No. 1 Foundry	24.00
No. 2 Foundry	23.50
No. 3 Foundry	23.00
No. 2 Southern	23.85
Gray Forge	22.50

Coke.—There is some improvement in the demand for foundry coke, but quotations for spot delivery on both foundry and furnace show little change. We quote spot furnace coke at $2.50, and foundry $3.35. For future delivery, foundry coke is selling at $3.25.

Finished Material. — Deliveries on sheets are now from 24 to 26 weeks, as they have been for some time, and buyers are in a quandary concerning their requirements so far in the future. One jobber received a letter inquiring for sheets, delivery after Jan. 1. The placing of orders is not heavy, however, on account of the slowness of delivery. Delivery of steel bars is almost as slow as that of sheets. Bar iron is still weak, and orders are not numerous. A fair tonnage of rails has been disposed of to steam railroads, and traction companies have taken a few hundred tons. Eastern mills are making somewhat better deliveries in sheared plates. There is good demand for implement specialties, on which the price is 25 per cent higher than it was last year. Some mills are now giving deliveries on structural shapes in eight to ten weeks.

Old Material.—The market remains inactive and has taken on the appearance of a waiting game between buyers and sellers. The mills do not seem anxious to buy and the scrap producers are exhibiting no greater willingness to sell. Cast iron is the exceptional grade and is active and strong. Turnings and borings are about holding their own. Wrought scrap remains very weak. The Pennsylvania lines west have sold a lot of 2,000 tons, and the lines east are in the market with a list of a very large tonnage. The Erie is also asking for quotations on a list. We have revised our quotations, and quote f. o. b. Cleveland, gross tons, as follows:

Old iron rails	$24.00 to 25.00
Old steel rails (re-rolling)	17.00 to 18.00
Old steel rails (under 6 feet)	18.50 to 19.50
Old car wheels	23.00 to 23.50
Steel boiler plate	14.00 to 14.50
Steel axles	21.50 to 22.50
Malleable iron (railroad)	18.00 to 18.50
Malleable iron (agricultural)	16.50 to 17.00
Heavy steel	16.00 to 16.50
Country mixed steel	14.50 to 15.00
Low phosphorus	21.50 to 22.50

We quote net tons as follows:

No. 1 R. R. wrought	$16.50 to 17.00
No. 1 busheling	14.50 to 15.00
No. 1 machine cast	18.00 to 19.00
Iron axles	25.00 to 25.50
Axle turnings	13.00 to 13.50
Wrought turnings (free from cast)	12.25 to 12.75
Grate bars	14.00 to 15.00
Pipes and flues	13.50 to 14.00
Tank iron	12.00 to 13.00
Hoop and band iron	8.50 to 9.00
Sheet iron	7.50 to 8.50
Wrought drillings	12.25 to 12.75
Stove plate	14.00 to 15.00
Cast borings	10.50 to 11.00

CINCINNATI.

Prices Are High, but Difficult to Quote.—Buying Not Extensive.

May 7.

Pig Iron.—Under the stimulus of the recent buying movement and the tonnage submitted to the furnaces, the market has become unsettled, as many firm offers have been turned down and furnace prices have either advanced, or the furnaces have withdrawn from the market, in so many cases that it is now difficult to locate prices for forward deliveries. Spot iron continues in light demand, also May and June iron, as the recent deliveries on contracts have given consumers ample iron for current needs. The general strength of the market imparts a steadier feeling in the spot market, however, but in this territory $21 Birmingham can still be done, although $21.50 is the more frequent asking price. We quote spot iron delivered Cincinnati as follows:

Southern foundry No. 1	$24.75 to 25.25
Southern foundry No. 2	24.25 to 24.75
Southern foundry No. 3	23.25 to 23.75
Southern foundry No. 4	22.75 to 23.25
Southern No. 1 soft	24.75 to 25.25
Southern No. 2 soft	24.25 to 24.75
Southern gray forge	21.75 to 22.25
Northern No. 1 foundry	26.65 to 27.75
Northern No. 2 foundry	26.15 to 27.15
Northern No. 3 foundry	25.65 to 26.65

May and June iron is quiet at $21.00 to $21.50 Birmingham.

For the third quarter, most quotations are withdrawn, but those southern furnaces that are naming prices range in their views from $19.50 to $21.50 Birmingham with Virginia iron on the basis of $22.00 Birmingham in this territory for No. 2 foundry. Some southern interests are reported sold up for the balance of the year, and some report nothing to offer for third quarter. This is interpreted by well informed men in the trade to mean that the iron is being held back for an advance in prices, or that southern furnaces prefer to have this iron to offer later on, having confidence that nothing will be lost by holding off at this time. It is believed that, with the present sold up condition of the northern stacks, there will be enough demand from both the north and the south to absorb the unsold tonnage for the third quarter still remaining. Low grades have strengthened also, but mottled, gray forge, and No. 4 are on an independent basis with prices irregular.

For the last quarter, $19.50 Birmingham is probably minimum, although it is believed generally that $19.00 can be done. Some important interests are asking $20.00, but we hear of no sales at the higher prices.

It is currently reported in the trade that some iron for delivery in the first quarter of 1908 has been sold at $18.25, Birmingham.

The flurry in the market has so unsettled the situation that it is difficult to quote prices with confidence. Furnaces apparently feel that they are in control. The business booked in the last few days has not been large, as agencies here have not had iron to offer except at prices which seemed high, and buyers have not followed the recent advances readily.

Northern iron for last quarter in the southern Ohio district is quoted mainly at $23.00 at furnace, and there is not much to offer. We quote for fourth quarter delivery, delivered Cincinnati, as follows:

Southern Foundry No. 1	$22.75 to 23.25
Southern Foundry No. 2	22.25 to 22.75
Southern Foundry No. 3	21.75 to 22.25
Southern Foundry No. 4	21.25 to 21.75
Southern Foundry No. 1 soft	22.75 to 23.25
Southern Foundry No. 2 soft	22.25 to 22.75
Gray Forge	20.75 to 21.00
Northern Foundry No. 1	24.65
Northern Foundry No. 2	24.15
Northern Foundry No. 3	23.65

Finished Material. — The market holds steady with a fairly good jobbing trade. Mill order business is quiet. Small orders are filled at the following prices:

Angles, 3 x 3 and over, 2.15c to 2.25c; beams and channels, 15 inches and under, 2.15c; small angles and architectural channels, 2.10c base; plates ¼ inch and heavier, 2.10c; 3-16 inch, 2.20c; No. 8, 2.20c; sheets (blue annealed) No. 10, 2.30c; No. 12, 2.35c; No. 14, 2.40c; No. 16, 2.50c; box annealed sheets, Nos. 18 and 20, 2.65c; Nos. 22 and 24, 2.75c; Nos. 25 and 26, 2.80c; No. 27, 2.85c; and No. 28, 2.95c. Iron and steel bars, 2.00c base; boiler tubes, 60 per cent off, base, turnbuckles, 45 per cent off; rivets, 3.15c base; cold rolled shafting, 45 per cent off list; steel tire, 2.10c base.

Coke.—The offerings continue ample with no material change in prices. There is more activity in the market, however, and the undertone is steadier. Standard Connellsville brands are rather firmly held. Prices in the leading coke producing districts are as follows:

Wise County, Va., Furnace Coke, prompt shipment	$2.75 to 2.90 per ton
Wise County, Va., Foundry Coke	3.25 to 3.50 per ton
Pocahontas Furnace Coke, prompt shipment	2.60 to 2.75 per ton
Pocahontas Foundry Coke	3.10 to 3.40 per ton
Connellsville Furnace Coke, prompt shipment	2.75 to 2.90 per ton
Connellsville Foundry Coke	3.25 to 3.75 per ton
New River Foundry Coke, prompt shipment	3.25 to 3.50 per ton
New River Furnace Coke, contract	2.75 to 2.90 per ton

*Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices on the following basis: $1.60 to $1.65 per ton on $9.00 pig iron, plus 17 to 18 per cent of the advance on pig iron above $9.00 Birmingham.

Old Material.—The market rules quiet and easy, but not quotably changed. We quote f. o. b. Cincinnati:

Old No. 1 R. R. wrought net tons.	$16.50 to 17.50
Cast machine and f'dy, net tons..	17.50 to 18.50
Old iron rails, gross tons.....	24.50 to 25.50
Old steel rails, gross tons.....	18.00 to 19.00
Old short lengths, gross tons....	19.00 to 20.00
Old iron axles, net tons.....	26.00 to 26.50
Heavy melting scrap, gross tons.	20.00 to 21.00
Stove plate, net tons.....	14.50 to 15.50
Wrought turnings, net tons.....	13.50 to 14.00
Cast borings, net tons.....	11.00 to 11.50
Car wheels, gross tons.....	23.50 to 24.00

PHILADELPHIA.

Pig Iron Market Continues Strong.—Some Furnaces Withdrawn.

May 7.

Pig Iron.—The market has lost none of the great strength it showed last week. Indeed, it seems to grow stronger daily, and in conservative quarters some anxiety is expressed lest the fierce demand for iron push prices to a point that will be sure to check the present great consumption. Leaving to the future the working out of that problem it may be said that for the present the demand is more insistent than it has been for months. There is practically no iron left for the second quarter, and when a producer does squeeze out a carload or two for a belated buyer the latter may consider himself lucky if he gets No. 2 X foundry under $26.50. Under this stress for spot shipment English iron, which is practically the only available supply, has moved up sharply, Middlesboro No. 3 bringing $22.25 to $22.50 in dock and Scotch $24.50 to $25. Some fairly large sales of basic have been made at $24 furnace for the second quarter and $23 furnace for the last half. Some of the largest producers will now accept no business from new customers, and a number of furnaces have withdrawn entirely from the market for the rest of the year. Some inquiries have been recorded for the first quarter of 1908, but no one is much disposed to take up the question of prices so far ahead. A large number of sales have been made for the last half, and there seems to be no doubt that it will be a period of great activity. Prices for that time show no great changes, but it may be said that they approach more nearly the higher range than the lower. Quotations, while hard to give with anything like exactness, may be stated approximately as follows:

No. 1X Foundry.....	$25.00 to 25.50
No. 2X Foundry.....	24.00 to 24.50
No. 2 Plain	23.50 to 24.00
Standard Gray Forge.....	22.50 to 23.00
Basic	23.00 to 23.75
Low Phosphorus	27.00 to 27.50

New Material.—There has been no especially notable feature since the last report. While there is considerable talk that prices of finished products are low in comparison with those of pig iron, no advance has yet been made. Mills report a fairly satisfactory volume of new orders, and prices may be quoted as unchanged: Beams, channels and angles, according to specifications, 1.83½c to 2c; refined iron bars, 1.83½c to 1.88½c; steel bars, 1.83½c to 1.88½c; plates, 2.03½c and 2.08½c.

Old Material.—The market is stronger, in sympathy with the general situation in iron and steel, and buying by the mills is somewhat better. Steel scrap is up a quarter and some other lines have advanced a half. Prices may be quoted as follows:

Old steel rails.....	$19.00 to 19.50
No. 1 steel scrap.....	18.75 to 19.25
Old steel axles.....	22.00 to 22.50
Old iron axles.....	29.00 to 30.00
Old iron rails.....	25.50 to 26.50
Old car wheels.....	23.00 to 24.00
Choice scrap R. R. No. 1 wrought	20.00 to 20.50
No. 1 yard scrap.....	18.50 to 19.00
Machinery Scrap	21.50 to 22.00
Low phosphorus scrap	23.00 to 23.50
Wrought iron pipe.....	16.00 to 17.00
No. 1 forge fire scrap.....	16.50 to 17.00
No. 2 forge fire scrap, ordinary..	11.50 to 12.00
Wrought turnings	16.50 to 17.00
Axle turnings, heavy.....	17.00 to 17.50
Cast borings	15.50 to 16.00
Stove plates	17.00 to 17.50

NEW YORK

Pig Iron Stronger—Foreign Prices Sharply Advanced—Some Sellers Withdraw.

Office of THE IRON TRADE REVIEW.
Room 1005, No. 90 West St., May 7.

Pig Iron.—From every point of view the situation is stronger than a week ago. The vigorous revival of activity then noted has increased steadily and has resulted in the placing of a large aggregate tonnage, with important inquiries pending. The week has developed a number of distinct features, among which may be noted the following: A sharp advance in the price of British irons, Cleveland warrants passing the 60-shilling mark, with a corresponding advance in foreign irons in the local markets; general advances by domestic furnaces, in many instances to a level at present prohibitive, and the withdrawal of several producers from the market; a realization of the inadequacy of the supply of steel-making irons during the remainder of the year, with some considerable sales of basic at prices higher than were rejected by the purchaser some weeks ago; the widespread report that a runaway market may be the outcome of the present situation.

In British irons the inroads into the Middlesboro stores continue at the rate of about 20,000 tons net loss per week. There have been further engagements for American shipment, the iron being purchased at about the same level at which the importer was glad to sell a few weeks ago. The present quotation, duty paid, is $22.50 to $23 tidewater for small lots, and $21.50 is the minimum for round tonnages, an advance of more than $1.00 in the month. The German movement is undiminished, and great difficulty is experienced in finding berths for the loading of vessels at English ports.

The heavy selling of the past fortnight has had the effect of influencing furnaces to hold more tightly to their small tonnages remaining unsold through the year. How little iron is still to be had may be estimated from the fact that in the Buffalo district four producers who have not yet covered their needs would clear out every ton which the merchant furnaces at that point will have to dispose of before Jan. 1. There is scarcely a furnace in the east which has not announced an advance of from fifty cents up, in some cases as much as $2.00 per ton being added. This latter has usually had the effect of withdrawing the furnace from the market, but producers insist that the figures at which they are holding will be reached. One southern interest is holding at $21.50 for third quarter delivery on No. 2 foundry, Birmingham. There is no longer any $18.50 iron to be had, and it is not probable that $19.50 can be shaded. In this connection it is interesting to remember that certain interests are still delivering $13.50 iron.

The General Electric Co. is in the market for about 12,000 tons of various irons, and the inquiry of 4,000 tons for a pump concern has not yet been filled; some bidders for the latter business have withdrawn their quotations. Several other good inquiries are pending, ranging in size from 5,000 tons down. A Coatesville concern is understood to have closed for 17,000 tons of basic. In malleable one concern is asking tenders on 3,000 tons for the last half, and another on 500 tons for the first quarter of next year. The tonnage closed in all irons during the last few days has been very large, one selling house reporting its April business, which was chiefly done during the last week of the month, as heavier than the entire first quarter. We quote tidewater prices as follows, the higher figures being for spot delivery:

Northern Foundry No. 1.....	$24.00 to 26.00
No. 2X Foundry.....	23.50 to 25.50
No. 2 Plain	23.00 to 25.00
No. 2 Southern Foundry..	23.50 to 26.00
Basic	23.00 to 24.50

Finished Materials.—Building operations closed during the week have been light. They include the Corn Exchange bank in Chicago, 4,500 tons, which went to the Brown-Ketcham Iron Works; a telephone building at Chicago, 1,200 tons, taken by a local concern; and a Pittsburg bridge, 500 tons, which went to the McClintic-

Marshall Construction Co. For export a number of small contracts have been closed, the most noteworthy being the Hotel Sevilla at Havana, 400 tons, which will be furnished by Milliken Bros. With the exception of structural shapes, for which the mills are only comfortably supplied with orders, there is pronounced activity throughout the finished field. Even those plate concerns catering to premium business are filling up and in one instance an offer of a considerable tonnage of light plates had to be refused. Tenders are now being received on the two giant battleships recently authorized by congress; each will require about 8,000 tons of shapes and plates, in addition to armor steel and other specials. Bar iron is in better demand; there are occasional reports of slight shading of prices, but these are given little credence.

We quote tidewater prices as follows: Angles, 3 to 6 inches x ¼ inch and heavier, 1.84½c; beams, 3 to 15 inches, 1.84½c; tees, 3 x ¼ and heavier, 1.89½c; plates, carloads, tank, 1.94½c; marine boiler, 2.24½c; refined iron bars, 1.89½c; soft steel bars, 1.74½c; sheets, No. 28, black, 2.60c.

Old Materials.—There is a better demand for all kinds of scrap, with the exception of wrought, which is a drug on the market. The undecided feeling which prevailed a fortnight ago has disappeared and the demand is thoroughly good. Borings are scarce and command good prices. The railway lists which came out for the first of the month called for only a fair tonnage in the aggregate. We quote New York delivery prices for gross tons as follows:

Old iron rails	$24.50 to 25.50
Old steel rails, long lengths	18.00 to 18.50
Old steel rails, short pieces	16.25 to 16.75
Relaying rails	28.00 to 29.00
Old car wheels	24.00 to 24.50
Old iron car axles	28.50 to 29.50
Old steel car axles	21.00 to 21.50
Heavy melting steel scrap	16.00 to 16.50
No. 1 railroad wrought scrap	18.00 to 18.50
Iron track scrap	17.00 to 17.50
Wrought pipe	14.50 to 15.00
Cast borings	13.50 to 14.00
Wrought turnings	14.75 to 15.25
Heavy cast scrap	19.00 to 19.50
Railroad malleable	17.00 to 18.00
Agricultural malleable	15.00 to 16.00
Stove plate	15.50 to 16.00
Grate bars	14.50 to 15.00

BUFFALO.

Market is Strong With Prices Unchanged.—Moderate Buying.

May 7.

Pig Iron.—The condition of the market this week is much the same as it was the week previous except that it is a trifle more quiet. Prices have not changed since the advance of last week and the tone of the market continues quite strong. There has not been heavy buying the past few days and not many very large inquiries have been received.

Furnaces generally report being sold up well for the last quarter and one firm has cut off quotations on iron for delivery the remainder of the year. Prompt iron continues as scarce as usual and the demand for Bessemer and foundry is especially strong at present.

A good many buyers have been looking about for odd lots of iron for prompt delivery, but have been able to pick up only an occasional tonnage which in most cases was not equal to their present needs. Indications point to a continued strong market here and the furnaces and buyers are governing themselves accordingly.

For fourth quarter delivery we quote:

No. 1X Foundry	$23.75 to 24.00
No. 2X Foundry	23.00 to 23.50
No. 3 Foundry	22.75 to 23.00
No. 2 Plain	22.50 to 23.00
Malleable Bessemer	23.00 to 23.50
Gray Forge	22.00 to 22.50
Charcoal	27.00 to 27.50

ST. LOUIS.

Pig Iron Market Strong.—Increased Scrap Demand.

May 6.

Pig Iron.—The market is exceptionally strong for immediate and future shipments. The demand is good, and No. 2 for the last quarter is quoted at $19.50, spot, Birmingham. Our quotations for the last quarter, including the freight rate from Birmingham of $3.75 range as follows:

Southern No. 1	$23.50 to 24.00
Southern No. 2	23.25 to 23.75
Southern No. 3	22.50 to 23.00
Southern No. 4	22.00 to 22.50
Agricultural Malleable	13.50 to 14.00
R. R. Malleable	14.50 to 15.00
Stove Plate	12.50
Cast Scrap	16.50 to 17.00

Coke.—The market is strong, with prices about the same as last report. The tone is good. Connellsville 72-hour foundry selected ranges in price from $3.25 to $3.50 for immediate shipments. Connellsville 48-hour furnace coke from $2.50 to $2.60. The rate for Connellsville coke, ovens to East St. Louis, is $2.80; to St. Louis, $2.90.

Structural Steel.—The architects of the city have quite a number of business and office buildings "on the boards," but nothing has been done toward the perfecting of plans and specifications. The market for structural steel is practically unchanged.

Old Material.—The market for scrap iron is strong with a slightly increased demand. Prices range as follows:

Old Iron Rails	23.00 to 23.50
Old Steel Rails, 3 feet and over	17.00
Old Steel Rails, less than 3 feet	16.50
Relaying Rails	31.00 to 32.00
Old Car Wheels	22.50 to 23.00
Heavy Melting Steel	16.00
Mixed Steel	14.00
Iron Angle Bars	17.50 to 18.00
Iron Car Axles	24.50 to 25.00
Steel Axles	19.50 to 20.00
No. 1 R. R. Wrought	16.00 to 16.50
No. 2 R. R. Wrought	15.00 to 15.50
Locomotive Tires	16.00 to 16.50
No. 1 Dealers' Forge	12.00 to 12.50
No. 1 Busheling	12.50 to 13.00
No. 2 Busheling	11.50
Turnings	12.50 to 13.00
Borings	8.50 to 8.75

BRITISH IRON MARKET

New Records in Reduction of Iron Stocks—Prices Are Advancing.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.
Birmingham, Eng., April 24.

Pig-iron has shown a marked improvement as compared with a week ago, a strong upward movement having set in, the end of which cannot yet be foreseen. Cleveland has been establishing records during the last week. The withdrawals from Connal's stores during the first eighteen days of this month have been 35,684 tons, while in one day no less than 17,522 tons were cleared. Both these are record figures. Yesterday's stocks at Middlesboro amounted to 416,943 tons. Apparently, the American demand is gaining force, and the Tees are simply blocked with vessels waiting for pig-iron. Orders are in some cases so imperative in the matter of time that smelters have had to refuse orders owing to their inability to execute them within the required period. The shipments would be much greater if the iron could be more promptly obtained. The prices of hematite, which have been stagnant for some time, now show a marked increase. Within the last week, Cumberland hematite has increased from £3 13s 8½d ($18.05) cash, to £3 14s 9d ($18.30). The market has been strengthened a good deal owing to the arrival of so many home buyers, many of whom have been waiting until the last moment in the expectation of lower prices. This idea has now been given up, and they are eager to renew contracts. This movement has given increased strength to Northampton and Derbyshire brands, in which large contracts have been made during the last week. The price of Cleveland yesterday was £2 16s 11d ($13.92), as compared with £2 15s 7d ($13.60) a week ago. The prices of Midland irons are only fractionally dearer, but there is a great increase of firmness.

BIRMINGHAM, ALA.

Pig Iron Market Extremely Strong—Sale for First Quarter of Next Year.

Birmingham, Ala., May 6.

The advance of from fifty cents to one dollar per ton on pig iron in the southern territory has not had much effect on the demand and steady buying is noted. Alabama manufacturers will shortly be compelled to withdraw from the market altogether as far as iron for delivery during the latter part of the year is concerned, if the business continues as it has been during the

past few weeks. It is admitted that sales so far this month exceed the production. In accepting orders for future delivery, consideration is given to the fact that the production will be increased shortly from five to ten per cent, several furnaces under repairs to be in operation before many more weeks have passed now.

A sale of 2,000 tons of iron for delivery during the first quarter of 1908 was one of the transactions of the past week. It is stated that $18 per ton is the price fixed for the product to be delivered during the first quarter of next year. A number of inquiries have been made in this direction, it is rumored, and the furnace companies appear to be positive that the demand is going to continue strong into next year.

METAL MARKET.

NEW YORK.

May 7.

Copper.—Consumers are still holding off and the volume of current business is not large, although the quotations made by the leading interest are being heavily shaded. The foreign markets have lost considerable of their former strength and the domestic situation is weak in sympathy. We quote as follows: Lake, 24½c to 25½c; electrolytic, 23½c to 24½c; casting, 22½c to 23½c. London closed yesterday at £104 7s for spot and £103 10s for future delivery.

Pig Tin.—Only immediate requirements are being covered and the current business is accordingly small. This is in sharp contrast with conditions abroad, where there is an active market. For future delivery prices have declined in the local market. We quote as follows: Spot, 42.15c; futures, 41.75c to 42.25c. On the London market yesterday's close was £192 for spot and £187 10s for three months' delivery.

Pig Lead.—The foreign demand continues good, but domestically there is little activity and the New York price of 6,00c is unchanged. St. Louis quotes 5.90c. At London soft Spanish closed yesterday at £19 12s 6d.

Spelter.—We quote as follows: Refined, 6.50c to 6.60c; St. Louis, 6.40c. G. M. B. closed yesterday in London at £26.

Antimony.—We quote: Cookson's, 23c to 24c; Hallett's, 19c to 20c; ordinary brands, 17c to 18c.

CHICAGO.

May 6.

Slightly better demand from railroads was apparent on the metal market during the week, but no purchases ahead were made. The only change in prices was a drop in the price of antimony which fell sharply over a cent. Copper recovered from the uncertainty of the last two weeks and ruled firmer, although the price was not affected.

Copper lake sold for 26c and casting between 25½c and 26c. Pig tin varied between 44c and 44½c, depending largely on the quantity purchased. Sheet zinc remained at 8.50c La Salle in car lots of 100-pound casks. Spelter was quoted at 7¼c. Lead desilverized in 50-ton lots sold between 6.50c and 6.60c and corroding between 7.25c and 7.35c. In car lots the price was 2½c per 100 pounds higher. Cookson's antimony dropped from 28½c to 27c and 27½c; other grades remained at 26c.

A distinct advance was observable in most of the second hand metals. The feeling among dealers that the prices had been too low resulted in a general advance.

Prices quoted by buyers were: Copper wire, 18.50c to 19c; heavy copper, 18c to 18.50c; copper bottoms, 17.25c to 17.75c; copper clips, 18c to 18.50c; red brass, heavy, 17.25c to 17.75c; yellow brass, heavy, 15.25c to 15.50c; red brass, borings, 15c to 15.75c; yellow brass, borings, 13c to 13.50c; light brass, 12.50c to 13c; pipe lead, 5.60c; tea lead, 5c; zinc, 5c; tin foil, 35c; pewter No. 1, 28c.

ST. LOUIS.

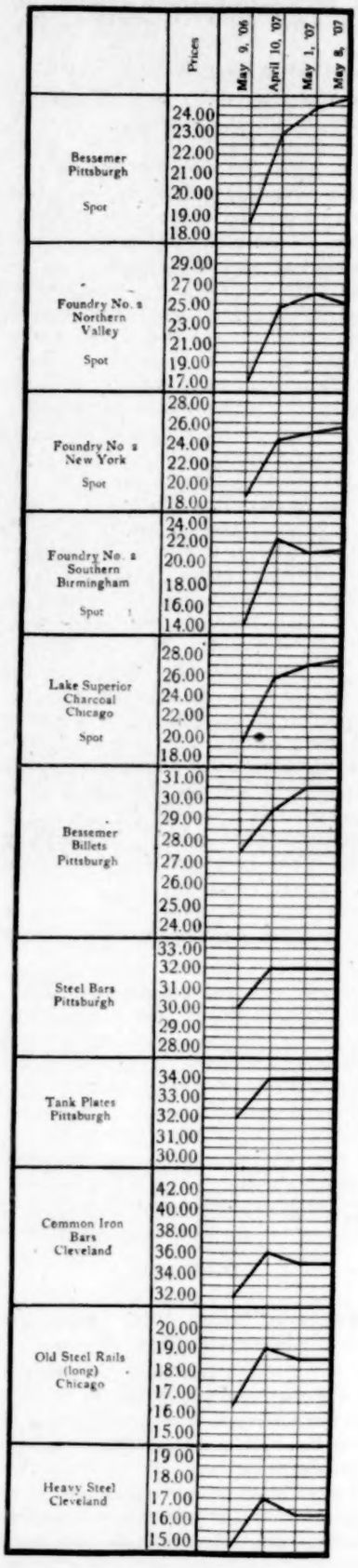
May 6.

Occasioned by the threatened demand of the miners for higher wages, the Yellow Dog mine at Joplin has restricted its output 150 tons a week by cutting off its night shift. An organized strike has never been known in the Joplin district, but labor agitators are there from other places, and it is said are endeavoring to solidify the miners into a union. These men readily secure an audience from the men who operate machine drills, owing to the inequality of wages of men who work underground. The machine drill men earn less than 25 cents an hour, while from $1 an hour to $15 a day for eight hours is paid for the most menial work in the mines.

The highest price paid for zinc ore last week was $51 a ton on an assay base price of $46 to $48 a ton of 60 per cent zinc. Lead appears to have found its level, the high price remaining for the fourth week at $82 a ton.

PRICE CHART.

Beginning with the present issue, the prices of pig iron in our price chart will be given for prompt delivery instead of for future delivery as heretofore. This change is made in order to make comparison with prices a year ago more accurate.



SPLENDID SPECTACLE

WAS RACE OF BOATS FOR DULUTH HARBOR.

Congestion at Ore Dock Soon Ended.—Mining Operations on the Mesabi Very Active.—Option on Section 30 Not Exercised.

Office of THE IRON TRADE REVIEW,
411 Providence Bldg.,
Duluth, Minn., May 4.

The delayed opening of navigation has placed a handicap of over half a million tons on this year's shipments of ore from the head of the lakes as compared with 1906. Where last year the first boats were loaded at Duluth and Two Harbors on April 11 and April 9 respectively, it was the 20th and 18th before any ore left the docks this year. At Duluth 101,909 tons were shipped in April as against 383,643 tons in April, 1906, and at Two Harbors, though 240,310 tons was brought down from the mines, but 105,249 tons were shipped as compared with 390,708 tons last season. The 1907 shipments from Superior for April were 106,678 tons in contrast to 210,263 tons in 1906. There was shipped, therefore, up to May 1 from these three ports a total of 313,836 tons which is 670,778 tons less than a year ago. This handicap will be quickly overcome, however, as there is a large fleet continually unloading at the coal docks here.

A new record for vessel tonnage entering one port in a given time was undoubtedly established for the world when the fleet held up at the Soo began filing through the canal into Duluth harbor at the beginning of this week. For 48 hours at any time four or five boats were in sight, heading for the harbor in a desperate race for dockage. The situation was unique; it was even dangerous and as a spectacle it was both tremendous and splendid. There was practically one continuous parade of freighters from the Soo to Duluth, beginning with a long blockade at Detour and extending in an equally long blockade, still in evidence in the bay here. Now the original number of over thirty boats has dwindled to a dozen and the coal docks are working as they never have before.

The ore dock was congested for but a short time as only a small percentage of the boats was light and a boat coming up light now will receive ordinary dispatch at the Missaba dock and will undoubtedly get in ahead of boats that started up with coal a fortnight ago. The condition at Two Harbors is not so good. Congestion prevails but a gradual relieving of the situation seems probable.

Mining operations on the Mesabi are extremely active. The Oliver Iron Mining Co. has about 90 drills at work, 35 of which are in one group on lands acquired under the Great Northern lease. Several independent explorations are in progress on the eastern end of the Mesabi range. The Midland Steel Co. failed to exercise its option on the section 30 tract which it took over for a time from the Shagawa Iron Co. and the property has reverted and is being developed by the owners with results which are claimed to be very satisfactory despite the great difficulty of exploring in the Vermillion range country. The Midland Steel Co. is again getting its ore on the market.

The new properties of the Republic Iron & Steel Co. and Pickands, Mather & Co. are beginning to look like mines, and will soon be shipping. The deposit which Pickands, Mather & Co. are opening up at Virginia is not large, but presumably from its location a very good ore. The shaft at the Syracuse on the shore of Lake Embarrass, sunk by the Foundation Co., has been successfully put down to rock and it is probable that some ore will be taken from the Syracuse this year. At the Bangor the shaft is about half-way down.

As was anticipated in these columns last year, from the appearance of the test pits at the Kellogg mine now operated by the New York State Steel Co. and situated just across the lake from the Bangor and Syracuse a very considerable amount of quicksand has been encountered. The main shaft and a timber shaft both down to between 80 and 90 feet are in the sand and it is proving a difficult matter to get the lining down the remaining 20 or 25 feet into ore. However, the deposit is well worth a little preliminary effort.

LAKE FREIGHTERS IN DULUTH HARBOR LAST WEEK WAITING FOR A DOCK.

Analyses of Iron Ores.—The book issued annually by the Lake Superior Iron Ore Association, Rockefeller Bldg., Cleveland, showing the complete average cargo analyses of Lake Superior iron ores has been compiled for the season of 1906. The edition is similar in appearance and arrangement to that of 1905. A number of new grades, the output of new shippers last year, are included and under Canadian ores in addition to the Helen ore of the Michipicoten range, as given in the 1906 book, Moose Mountain ore from the Sudbury district is given for the first time.

Will Erect Plant.—A. W. Phelps, manager of the St. Louis Malleable Castings Co., St. Louis, Mo., has severed his connection with that concern April 30. His intentions are to locate in the vicinity of Pittsburg, and erect an entirely new malleable plant with an output of at least 25 tons of castings per day. It is expected to have the new plant in operation by Aug. 15, next.

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A FOUNDRYMAN'S COMPLAINT.

We have received a letter from a subscriber in Joliet, Ill., who calls attention to the following paragraph published in the Cincinnati market report of THE IRON TRADE REVIEW of April 25:

Spot iron rules quiet, as deliveries continue good, thus reducing the necessity for buying spot iron at the premiums now prevailing. There is not much offered, however, and when arrivals are not easily placed, the iron is shipped on some contract, thereby preventing an over supply.

Commenting upon this paragraph, our esteemed correspondent says:

This is the first time that I have seen these conditions in print. Does it not seem strange and shameful to you when you consider the fact that iron that should have been delivered on contracts during the fall and winter of the past season has almost all been diverted to the spot market and foundrymen, especially the smaller foundrymen, have been compelled to go to the jobbers and buy the self same iron at a premium of from $5 to $7 per ton, when in reality the furnace companies owed them this iron on their contracts, putting up the story that scarcity of cars would not permit their making shipments? Generally speaking, the foundrymen have turned out a greater tonnage of castings during the past winter than ever before. All of them have run full and many of them away beyond what their capacity was considered. This iron did not come on contracts, but was purchased from spot markets and at an advanced price. On the other hand, the contracts for the castings, nine times out of ten, were made early in the season on a basis of contract prices of pig iron and regardless of the cost of the material must be filled at the original price.

You can readily see that the furnace companies have robbed the foundrymen of whatever little profit there was in sight in their manipulation, and we might come right out and say, by their dishonest methods. It seems as though something ought to be done regarding pig iron contracts.

Our correspondent raises an old question, but, on account of some special conditions existing in the Cincinnati district, we are glad that he has done so, as it affords an opportunity to make an explanation which may be of considerable interest to others than the writer of the letter. He has misinterpreted the paragraph in the Cincinnati report to which he refers. It was not intended to intimate that any dishonest practices were being carried on. During the recent car scarcity in the south, nearly every Cincinnati agency had customers calling for iron on contracts. At the same time the agents had iron due to themselves, which they had bought for speculative purposes, and on which they expected to realize a profit. In many instances agencies would apply their own iron on contracts in order to keep their customers satisfied, and agreed to take the iron due to the customer when it arrived. This substitution went on with a good deal of regularity, and some of the agents actually sacrificed considerable profit to hold their customers and keep them from closing their plants for want of iron or paying high spot prices. When the car situation improved and spot premiums began to shrink, there was considerable iron coming in which the agencies were forced to take, as they had given the customers agency iron and taken the customers' iron in its place. In order to prevent an accumulation of spot offerings, the agents asked the customers to allow them to anticipate shipments on pending contracts and shipped the surplus iron on these contracts, sometimes before it was due. There may have been instances where the furnaces disregarded their obligations, for honesty is not universal among furnacemen any more than it is among foundrymen, or any other class of human beings, but, so far as we have been able to ascertain, furnacemen did not violate their contracts. All lines of business were sorely hampered, and the same complaints were made by grain men and others as by those in the iron trade. When the foundryman could buy in the spot market the same brand of iron that was due him on a contract, he had some right to feel suspicious, but things are not always as they seem, and they were not in these cases. We believe that furnaces apportioned their shipments as fairly as they could, and acted conscientiously. It was a trying time for the whole trade, and in looking for an explanation of the difficulties and disappointments incident to the situation, it was natural for the foundrymen to assume that they were unfairly dealt with. It will be well for the foundrymen to remember that the furnacemen had their troubles. The accumulation of iron in the Birmingham district Feb. 1 was about 60,000 tons, and it could not be moved on account of lack of cars. The money of the furnaces was tied up in this iron. They were hampered in operations and paid high spot prices for coke, because the advance in spot iron prices put up coke prices where contracts were based on a sliding scale of iron prices.

We trust that our Joliet correspondent and others who may be disposed to question the honesty of men from whom they have purchased will take a more cheerful view of the situation. It is, of course, a temptation to sell at present high spot prices rather than deliver at low contract prices, but we know of many cases in which this temptation has had no effect, and we believe that, as a rule, furnacemen are conscientiously adhering to the performance of contracts.

STEEL CORPORATION'S QUARTERLY SHOWING.

As has been remarked before in these columns, the quarterly and annual reports of the United States Steel Corporation represent bookkeeping operations which have been conducted with the same fidelity at one time as at another, so that comparisons between them afford real knowledge which can be accepted without the reserve which events have

shown would have been appropriate with many industrial companies in the past.

The earnings reported last week for the first quarter of this year, $39,122,492, were the largest reported for any first quarter in the corporation's history. The total is exceeded by those for no quarter except the second and fourth of last year. The falling off from the higher of these quarters, the fourth, is only $2,600,000. The odd $600,000 may be attributed to the commendable change of methods inaugurated Jan. 1, last, by which blast furnace relining is charged to operation rather than included in "extraordinary replacements." A portion of the remaining difference is chargeable to the flood in the Pittsburg district the middle of March, by which production was lost or deferred, there being little loss of actual property.

The prospects for large earnings in the remaining quarters of this year are even better than they were in 1906, so that, as earnings for the first quarter of this year exceeded those for the corresponding quarter of last year, there is the best reason to expect that, in their turn, the large records made in the second and fourth quarters of 1906 will be broken.

The special funds reserved during the quarter are at the greatest rate yet shown, as a special improvement and replacement fund of $1,000,000 was set aside along with the regular funds, while $14,500,000 was deducted from the surplus shown for the quarter, a total of $15,500,000. In the year 1905, when such appropriations were larger than for any previous year, there was $7,500,000 set aside with the regular funds, and $50,000,000 deducted from the year's surplus, a total of $57,500,000, while the comparable appropriations in the first quarter of this year were at the rate of $58,000,000 a year.

The quarter's contribution to surplus is $3,684,576, which puts the total surplus, for the first time, to an amount just above $100,000,000. It is the smallness, rather than the largeness, of this surplus which is to be commended. The corporation has shown net earnings in its six years of existence of more than $700,000,000. Easily it could have modified its system of bookkeeping, and shown a surplus more than double that which it now carries, and then, should adversity overtake it, it would have had to go back of the returns, as so many industrial companies have had to do in the past. The United States Steel Corporation may have to face adversity, but it is at least certain that there will be no occasion for regrets as to the manner in which it has compiled its book surplus. Nor has it appropriated to improvements more than it has. Its unexpended appropriations can be identified, and its plans as to new construction have not outrun its appropriations.

OLD MINES,

Long Inactive, Will Again be Worked by Pennsylvania Owners.

The high prices now ruling for Lake Superior ores are having a natural effect in reviving the iron ore industry of eastern Pennsylvania, which was once highly prosperous, but has waned since the discovery of the richer and more easily mined ores of Minnesota. Note was made not long ago of the purchase by the Bethlehem Steel Co. of the Boyertown mines, which were first opened nearly 200 years ago. The Richard Heckscher & Sons Co., which operates the blast furnaces at Swedeland, about 15 miles from Philadelphia, has resumed the mining of ore from old mines lying within half a mile of its plant, and the owner of an adjoining mine, which has not been worked for 50 years, is said also to contemplate the resumption of work. The Heckschers are also interested in a plan to reopen the old Hopewell mine, distant some 15 or 20 miles from their furnaces, which has not been worked in a long time and is full of water.

If these operations prove successful and Lake Superior ores continue at their present level or advance, there is little doubt that scores of other abandoned mines in Eastern Pennsylvania will gradually become active again. Their ores, when blended with richer ores brought in from Cuba, Spain, Sweden and other foreign countries, produce excellent iron. With these local supplies to draw on, supplemented by foreign ores, the furnace men of Eastern Pennsylvania and New Jersey feel that they occupy a stronger and more independent position than those producers of the middle west who are entirely dependent upon Lake Superior ores.

The plants of the Pawtucket Mfg. Co. and Fales & Jenks Machine Co., Pawtucket, R. I., have started on a 55-hour schedule, a reduction of five hours.

ON TO PHILADELPHIA.

Pittsburg Association Arranging for the Trip.—A Cordial Invitation.

The Pittsburg Foundrymen's Association is making preparations to send a big delegation to the American Foundrymen's Convention and Foundrymen's Supply Association Exhibit at Philadelphia, May 21-25, and at the regular monthly meeting held at the Annex hotel, Pittsburg, Monday evening of this week, discussed plans.

Dr. Richard Moldenke, secretary of the American Foundrymen's Association, was present and was elected an honorary member of the Pittsburg association. He said the coming convention would be the biggest and most important in the history of the association, that between 1,200 and 1,500 visitors were expected. Among other things to be seen will be the very latest appliances and foundry equipment in active operation. A great variety of papers have been secured by Dr. Moldenke, and these will be read and discussed at the meeting and he intimated that a committee would be appointed at the convention to cooperate with the government in compiling a treatise on uniform cupola practice and also stimulate the movement toward the establishment of an elaborate research department.

Dr. Moldenke also urged that all members take their wives to Philadelphia, saying that the entertainment program as outlined included for them a trip to Atlantic City, carriage rides through the city and a sight-seeing trip to points of historical interest as well as participation in the steamer trip down the Delaware river.

S. T. Johnson, of Chicago, president of the Foundrymen's Supply Association, extended another general invitation, saying that it would be well worth the time and that no foundryman should miss the exhibition of molding machines, core making machines and other foundry equipment.

H. M. Lane, of Cleveland, secretary of the Foundrymen's Supply Association, said that twelve firms would exhibit molding machines and that one firm would have eight types of machines, and that other money and time-saving machines would be there in operation.

A special committee composed of H. E. Field, F. H. Zimmers and J. S. McCormick was appointed to make arrangements for the Pittsburg delegation to attend.

FOUNDRY TOPICS

Which Will be Discussed at the Philadelphia Convention of the A. F. A.

Both in number and interest, the papers that will be presented at the Philadelphia convention of the American Foundrymen's Association, May 21 to 24, promise to surpass those read at previous meetings of this organization, and many subjects not hitherto considered will be exhaustively discussed by prominent men in the trade. Papers will be read as follows:

"The Carnegie Technical School Foundry," Director Hammerschlag, Pittsburg.

"The Training in Foundry Work at Pratt Institute," Prof. Wm. C. Stimpson, Brooklyn.

"Industrial Foundry Education," Herbert E. Field, Pittsburg.

"Twenty Years' Improvement in the Brass Foundry," Chas. J. Caley, New Britain, Conn.

"The Use of the Heated Mixer in the Foundry," J. B. Nau, New York.

"Comparative Cupola Practice," W. S. McQuillan, South Norwalk, Conn.

"Cost Accounts," H. J. F. Porter, New York.

"Copper in Cast Iron," Wm. M. Saunders, Providence.

"Sound, Clean Castings," David Spence, Franklin, Mass.

"The Layout and Construction of Foundry Buildings," Geo. K. Hooper, New York.

"Industrial Betterment," H. F. J. Porter, New York.

"Small Points in the Core Room Which Are Not Considered," Geo. H. Wadsworth, Cuyahoga Falls, O.

"Foundry Design and Construction," F. A. Coleman, Cleveland.

"The Gray Iron Foundry as a Business Venture," Thos. D. West, Sharpsville, Pa.

"The Steel Foundry as a Business Venture," W. M. Carr, New York.

"The Malleable Iron Foundry as a Business Venture," Dr. R. Moldenke, Watchung, N. J.

"The Evolution of the Foundry Business," E. B. Gilmour, Elizabethtown, Pa.

"Modern Blast Furnace Practice," Edgar S. Cook, president Warwick Iron & Steel Co., Pottstown, Pa.

"Cast Thread Fittings," Henry B. Cutter, Seneca Falls, N. Y.

"The Supply of Skilled Labor for the Development of Our American Industries," M. W. Alexander, vice president American Society for Industrial Education.

"The Universal System of Molding Machines," E. Ronceray, Paris, France.

"A New Method of Preparing Molding Sand," E. Ronceray, Paris, France.

"Shop Kinks, or Short Cuts, or Don'ts," Cleveland Patternmaker Foremen's Association.

"Manganese in Cast Iron," Herbert E. Field, Pittsburg.

"A Few Denatured Brass Foundry Notes," Wm. H. Parry, Brooklyn.

"Uniform Cost Accounts for Jobbing Foundries as Recommended by the Jobbing Founders' Association," by the cost committee of that association.

"Dry Galvanizing," Alfred Sang, Pittsburg.

"Cupola Linings," A. F. Spencer, Pittsburg.

"Design for a Modern Pipe Foundry," J. B. Nau, New York.

"Standard Methods for Analysis of Cast Iron," H. E. Diller, Chicago, Ill.

"A Plea for the Apprentice," Wm. Gebb, Jerome, A. T.

"Some Facts Concerning Trade Schools," W. W. McCarter, Marietta, Ga.

"Notes on Bronze Castings," C. E. Johnson, Dorchester, Mass.

"Nickel in Cast Iron," Jas. F. Webb, Elkhart, Ind.

TWO HUNDRED NEW TYPE COKE OVENS TO BE ERECTED.

The Connellsville Central Coke Co., the output of which is controlled by J. H. Hillman & Son, of Pittsburg, has announced its plans to erect 200 of the modified Belgian type coke ovens at the Herbert Works, New Salem, Pa., and the work is now under way. Contract for the brick has been closed with the Harbison-Walker Refractories Co. of Pittsburg. These new ovens will be 35 feet long and five feet wide, and although larger, are after the same general plan as the experimental ovens erected last fall at the Mt. Braddock plant of the Rainey Coal & Coke Co. One million six hundred thousand lime bond silica and clay brick will be used in the new plant.

May Raise Rail Rate.—An advance in the freight rate on steel rails, to conform with the increased tariff on pig iron and billets, which will go into effect on June 1, is now being considered by traffic managers in the Pittsburg and Cleveland districts. It is stated that the increase, while not officially announced, is practically certain.

PUBLICITY DESIRED

Says J. A. Coakley, Speaking for the Railroad Shippers.—Railroad Notes.

Speaking before the Transportation club at Cleveland, May 3, under the auspices of the Cleveland division of the National Association of Freight Traffic Agents, J. A. Coakley, division freight agent of the American Steel & Wire Co., informally touched upon suggestions made by M. E. Ingalls, chairman of the board of directors of the Big Four railroad, before the Traffic club, of Pittsburg, whereby a closer relation between the railroads and shippers could be fostered. Referring to Mr. Ingalls' statement that the railroads ought to be permitted to join in an association for common benefits, Mr. Coakley declared that from a shipper's standpoint there would be no objection to such a union of interest, provided these meetings were open to the public. He believed that the anticipated proceedings and subjects of discussion should be freely advertised in the daily press or in some other suitable manner before the meeting of the association, and that shippers should be given a hearing before the railroad officials upon matters relative to freight transportation affecting themselves. He said that by this means many of the disadvantages met with in the past on both sides, resulting from changes in rates and matters of a like nature, would be eliminated.

Orders Steel Cars.

The Pennsylvania railroad has begun the placing of orders for steel cars for use in its New York terminal tunnels. In all, it is stated, about 1,000 passenger cars and 500 Pullmans will be required, as steel cars only will be used in the tunnels. Contracts have just been closed with the American Car & Foundry Co. for the building of 90 cars and with the Pressed Steel Car Co. for 85, while the Altoona shops of the road will build 25. Two types are to be used, a car 70 feet long and seating 88 passengers, for long distance travel, and a car 53 feet long, and seating about 70 passengers for suburban service, the latter being so arranged as to permit the installation of motors when occasion arises. The cars are to be practically collision-proof.

The Central of Georgia railroad has broken ground at Macon, Ga., for its extensive new shops.

The Interborough-Metropolitan Co. New York, has closed a contract with the American Car & Foundry Co. for 50 steel passenger cars for service in the subway and 200 wooden cars to be used on the elevated.

RAILROAD CONFIDENCE

Disclosed by New Lists of Machine Tools Required.—Traction Purchases.

Office of THE IRON TRADE REVIEW.
1362 Monadnock Block, Chicago, May 6.

Dealers who have been anxiously watching the machinery market for the past few weeks were cheered during the week by signs of reviving confidence on the part of the railroads. Following the ordering of the machine tools for which specifications were sent out six weeks ago by the Grand Trunk Railway system, two other lists were sent out by the same company. A list was also sent to local dealers by the Seaboard Air line for shops at Portsmouth, Va.

The general feeling among all connected with the machinery trade seemed to be more optimistic. Throughout the depression, few men could be found who would admit a belief that the hesitation on the part of large buyers was more than temporary. The relief expressed now, however, indicates that their fears were greater than they would admit even to themselves.

In addition to the lists already mentioned, other large orders are expected, the inquiries have increased and the opinion is expressed that orders which have been delayed apparently for other causes will be sent out.

The Union Traction Co., acting under the ordinances recently granted, has placed large orders for new equipment during the past week. The contracts signed represent $2,000,000. From the Lorain Steel Co., 10,000 tons of grooved rails were ordered. Contracts for power were made with the Chicago Edison Co. and 1,600 motors were ordered from the General Electric Co.

The general tone of the machinery market on small orders was good. Numerous orders for one or two machines for shop enlargements were taken.

The lists sent out by the Grand Trunk were for the shops at Stratford, Ont., and Montreal. The specifications are to be returned by May 12. The lists are as follows:

STRATFORD SHOP LIST.

1 cylinder planer 48 x 60 x 84 inches, motor-driven; 1 36 x 36-inch planer, motor-driven; 1 single frame steam hammer, 1,100 pounds; 2 single frame steam hammers, 1,500 pounds; 1 horizontal cylinder boring machine with adjustable table and three spindles to bore up to 35 inches, motor-driven; 1 heavy single spindle vertical wood boring machine; 2 36-inch boring mills, motor-driven; 2 eight-foot boring mills, motor-driven; 1 boring mill, 42-inch; 1 18-inch slotter, motor-driven; 1 15-inch slotter, motor-driven; 1 20-inch brass finisher's cabinet lathe; 1 18-inch brass finisher's monitor turret lathe; 1 automatic turret lathe, 3¼ x 8 inches, belt-driven; 1 set No. 7 plate bending rolls, 14-foot, capable of bending 7/8-inch plate, motor-driven; 2 universal tool grinding machines to grind tools up to three inches square; 1 slide bar grinder or planer, surface 80 x 20 inches, motor-driven; 1 24-inch traverse shaper equipped for motor attachment; 1 nut facing machine to face nuts from ½ to three inches; 1 universal radial drill, 60-inch, motor-driven; 1 lever drill, 20-inch; 1 vertical drill, 28-inch; 1 universal radial drill, 72 inches; 1 vertical drilling machine, 36-inch; 1 double car axle lathe, motor-driven; 1 engine lathe, 24-inch swing, 15 feet between centers; 2 engine lathes, 20-inch swing, 5 feet 4 inches between centers; 3 bolt lathes; 1 universal milling machine, 30 x 9 x 19 inches, table 48 x 12 inches; 1 centering machine, 1 hydraulic pump, 10 x ½ x 12 inches; 1 triplex bolt cutter; 1 power hack saw; 1 single punch and shears 66-inch throat, motor-driven; 1 pressure blower.

MONTREAL SHOP LIST.

1 ring and circle shears for tinsmith shop; 1 tinsmith's power press; 1 20-inch drill press; 1 hydraulic wheel press, 400 tons; 1 steel tire car wheel lathe; 1 woodworking lathe, 12-foot bed; 4 tool room lathes, 16-inch swing x 36-inch centers; 1 monitor lathe, 16 inch; 1 24-inch turret and chucking lathe; 1 30-inch engine lathe; 1 automatic turret lathe; 1 universal saw bench; 1 band saw, 36-inch wheels; 1 boring mill, 84-inch; 1 three-spindle vertical wood boring machine to clear 16 inches; 1 universal radial drill, 60-inch; 1 universal milling machine, 30 x 10 x 19 inches; 1 No. 4 universal milling machine; 1 slotter, 12-inch; 1 No. 1 grinder; 1 twist drill grinder, capacity ¼ to 2¼ inches; 1 single frame steam hammer, 1,100 pounds; 1 panel planer, 24 x 7 inches, 24-inch blade; 1 hand planer and jointer, 20-inch; 1 draw cut planer, 48 x 48 x 72 inches.

PERSONALS.

R. B. Wellman has resigned as superintendent of the open-hearth department of the Atlanta Steel Co., Atlanta, Ga.

E. C. Converse, director of the United States Steel Corporation, is now on a European trip.

Rowe Price of Tallapoosa, Ga., has been elected secretary and treasurer of the Southern Car Wheel Iron Co. of that city, to succeed the late Ralph Brown.

Fred A. Geier has been elected president and Frank Huschart vice president of the Bickford Drill & Tool Co., Cincinnati, of which concern the late H. C. Hoefinghoff was the head.

F. E. Reed, president of the F. E. Reed Co., Worcester, Mass., maker of lathes, has returned from an extended sojourn in southern California for the benefit of his health.

W. H. Von Mengerinhausen has been elected general manager of the Catasauqua Castings Co., Catasaqua, Pa. He was for several years manager of the Bloomsbury Foundry & Engineering Works.

J. T. Gibson, superintendent of the Carnegie Steel Co.'s furnaces at Steubenville, Mingo and Bellaire, O., has resigned, and W. C. Molten, superintendent of the Mingo plant under Mr. Gibson, has also tendered his resignation.

S. T. Wellman has been elected chairman of the board of directors of the Wellman-Seaver-Morgan Co., Cleveland, in place of John W. Seaver, who has resigned. Mr. Seaver still remains a director of the company.

H. W. Canning has been appointed a new southern representative of the Whiting Foundry Equipment Co., Harvey, Ill., manufacturer of cranes and foundry equipment, and will have headquarters in the Brown-Marx building, Birmingham, Ala.

H. K. Wood, president of the Wood Shovel & Tool Co., Piqua, O., has gone for a two months' trip to the Pacific coast. Mr. Wood will combine business with pleasure, and while in the west will visit the agencies of his company in that part of the country.

F. I. Cordo has been appointed purchasing agent of the Griffin Wheel Co., Chicago, with headquarters at the Sacramento Avenue works. S. L. Prest, formerly comptroller, has been elected treasurer, and G. F. Griffin, manager of the review department, has been made secretary. These appointments have been made to fill the vacancies caused by the recent death of P. J. Geraghty.

Evan F. Jones, manager of the purchasing department, International Harvester Co., has resigned to accept the appointment of vice president and general manager of the Southern Steel Co., with headquarters at Birmingham, Ala. Before his depature, Mr. Jones was presented with a loving cup by his former associates in the purchasing department, J. B. Pauley making the presentation in a few happy and appropriate remarks. H. B. Utley, formerly superintendent of the Keystone Works, Streator, Ill., succeeds Mr. Jones. Before the absorption of this plant by the International Harvester Co., Mr. Utley was its general manager, having accepted that position after a long connection with the McCormick Harvesting Machine Co.

OBITUARY.

Charles E. Hanika, Muncie, Ind., died recently at Asheville, N. C., where he had been taken for treatment for lung trouble. He was a foundryman in Muncie.

Thomas Lynch, a retired iron manufacturer of Brooklyn, died April 16 at his home in that city, where he had resided for nearly half a century.

John Corbus died at Beaver Falls, Pa., April 21, at the age of 78. He was superintendent of the car works at Beaver Falls until the plant was destroyed by fire.

Marshall L. Hinman, joint founder and for many years president and treasurer of the Brooks Locomotive Works at Dunkirk, N. Y., died March 3 at the age of 65. He was a native of New York state, his ancestry being prominent in the revolution. With H. G. Brooks he founded the locomotive works at Dunkirk, now one of the chief plants of the American Locomotive Co. He was repeatedly elected mayor of Dunkirk and held many other civic positions of trust.

Continued Large Production of Pig Iron.

An increase in the total producing capacity and in the total production featured the operation of the blast furnaces of the United States during the month of April, as reported by the companies for that period. The gain in the total output was 4,826 tons, a comparatively small figure, but the unusually large production shown by March, considering the large number of furnaces out of blast and the further consideration of April being a shorter month, make the record a good one. The grand total for April reached 2,191,535 tons, as compared with 2,186,709 tons in March. Reduced to total daily output, the figures stand at 73,051 tons in April, compared with 70,539 tons in March, an increase of 2,512 tons per day. The total number of furnaces was increased during the month by one by the blowing in of the new stack of the Bethlehem Steel Co. Furnaces in blast were 317 on April 30, compared with 304 March 31. Taken as a whole, the month of April showed a healthy condition of the pig iron industry of the country.

APRIL FURNACE REPORT.

State.	No. of stacks.	No. in blast on last day of month. Mar.	Apr.	Actual tonnage make. Merchant stacks.	Non-Merchant stacks.	Totals. Mar.	Apr.
Pennsylvania	149	124	132	237,634	764,299	937,683	1,000,933
Ohio	60	56	56	142,555	329,614	482,188	472,169
Alabama	44	28	30	119,632	21,800	143,947	141,463
Virginia	21	17	16	26,031	15,866	42,562	41,897
New York	24	19	20	65,107	77,134	151,051	142,241
New Jersey	10	9	9	30,133	.....	35,567	30,133
Tennessee	18	11	12				
West Virginia	4	4	4	30,805	38,720	61,606	69,525
Kentucky	6	3	3				
Maryland	4	4	4				
Illinois	23	19	20				
Wisconsin	6	3	4	17,795	241,449	281,234	259,244
Colorado	5	4	4				
Georgia	1	0	0				
Minnesota	1	1	1				
Michigan	1	1	1	15,696	.....	15,977	15,696
Missouri	1	1	1				
Spiegel—All states				5,593	8,881	*34,894	14,474
Ferro—All states				1,605	2,155		3,760
Totals	378	304	317	701,586	1,489,949	2,186,709	2,191,535

*Spiegel and ferro.

In compiling the April report THE IRON TRADE REVIEW has made a special effort to ascertain just what portion of the tonnages made by the various companies was consumed by the mills of the producers, and what part was placed upon the market as merchant iron. These totals have been differentiated in the accompanying table under the heads of non-merchant and merchant stacks. In the past those tonnages that were made for the companies' own use and those that were available for the buying public have never been clearly given, but it is believed that this month's figures will show the situation in this respect as it now exists.

BLAST FURNACE NOTES.

Furnace A of the Wisconsin Steel Co., Chicago, which was blown out on March 22, was blown in May 4 after rebuilding shell and relining.

The Northern furnace of the Northern Iron Co., Port Henry, N. Y., went out of blast on April 17 for repairs.

G. M. Black, superintendent of the Cleveland Furnace Co., Cleveland, has resigned, and has been succeeded by G. W. English.

The Globe Iron Co., Jackson, O., expects to blow in its furnace about May 10.

The furnace of the Ohio Iron & Steel Co., Lowellville, O., blew in on April 28, having been out for repairs since March 31.

The No. 2 stack of the Milwaukee furnace of the Illinois Steel Co. blew in on April 2.

Stack A of the Iroquois Iron Co., Chicago, was blown in on April 22.

The Rockdale Iron Co., Rockdale, Tenn., expects to blow in its stack about May 20.

Furnace A of the Northwestern Iron Co. will be blown in about June 1.

The Victoria furnace of the Chapman Iron, Coal & Coke Co. is now being relined and will operate under the control of the Goshen Iron Co., Wilmington, Del.

The new furnace E of the Bethlehem Steel Co. was blown in on April 20.

During the week ending Saturday, April 13, the Lebanon Valley furnace of the Lebanon Valley Furnace Co. made 502 tons of low phosphorus, low sulphur Bessemer iron from all Cornwall ore, breaking all previous records on a similar burden.

The Pequest furnace, Buttzville, N. J., of the Pequest Co., was blown out permanently on May 1.

The Soho furnace of the Jones & Laughlin Steel Co. was blown in April 30 after having been out since March 5, for complete relining. During this time, two new columns, a new mantle and the first sheet above the mantle were put in; a new water system complete, including a 75-foot by 16-foot water tower, a new downcomer, dust catcher, and centrifugal dust separator were installed and various changes made in the gas and hot blast mains.

The Saxton, Pa., blast furnace, which was purchased last fall by ex-Congressman Joseph E. Thropp, after laying idle several years, was blown in last week after very thorough repairs. It has a capacity of 200 tons a day and will run on foundry iron. Pilling & Crane, of Philadelphia, are the selling agents.

The furnace of the Penn Iron & Coal Co., Canal Dover, O. (M. A. Hanna & Co.) will be blown out for relining this week.

CAST IRON SCRAP

Shipped from Shakespeare's Home for Use in New England.

Reference was recently made in the IRON TRADE REVIEW to the curious transaction in which several thousand tons of Chinese pig iron were bought by a large American interest for importation into this country, because of the prevailing scarcity. An almost equally remarkable sale of an international character, is reported from Philadelphia, where a large firm dealing in old materials has purchased about 2,000 tons of cast scrap in England for use in this country. The stuff is broken funnel plates, which, curiously enough, come from Stratford-on-Avon, Shakespeare's home, whence they were shipped down the Avon on barges and loaded on a steamship at London for Boston. The scrap has been sold to New England firms. It is not unusual to ship old material from the Pacific coast to the Atlantic by vessel, and it also comes in from the West Indies, but this importation is said to be the first that has ever crossed the Atlantic from England. As it has to pay a duty of $4 a ton and about $1.50 freight, and can still be sold at a fair profit, it is evident that scrap is selling much cheaper abroad than in this country.

NEW PROCESSES

Are Being Tried at Colorado Fuel & Iron Co. Plants.

Pueblo, Colo., May 4.—A novel scheme has been adopted at the Colorado Fuel & Iron Works to melt out a frozen blast furnace. It has been decided to place tuyeres immediately under the bleeders temporarily and convert the furnace into what is known as a down-draft furnace. The gases resulting from this process will be conducted through the stoves to be further heated, and then used as fuel under the water tube boilers. The frozen ore and metal is located at the bosh of the furnace, and with the arrangement as planned the bustle pipe and tuyeres will be installed about ten feet below the top of the furnace, and the hot blast will then be able to penetrate the loose ore, coke, etc., on top and gradually melt the solid mass of material below. Kerosene is being used for fuel in the thawing out. The burner being used was designed and built at the Minnequa plant.

A new 3,000 horsepower Southwark tandem compound engine has been installed and the trial run made.

The new process which does away with the blast furnace and converter in the manufacture of steel, which was discovered in Australia, may be given a thorough trial at the Minnequa plant. It is called the Heskett-Moore system for directly converting iron ore into malleable iron or steel by a continuous process and is said to effect a saving of 25 per cent in the manufacture. The ore is simply concentrated by ordinary methods, or if it is magnetic it is electrically separated until the pure oxide of iron is obtained. The oxide of iron is passed through a revolving cylinder heated by waste gases from subsequent processes and brought into contact with the deoxidizing gases, which are forced up through to the heated ore receptacle. The heated ore is thus converted into pure iron. Accompanied and protected by the deoxidizing gas, it is passed into a third chamber or melting hearth where it falls into a bath of molten iron and is convérted directly into steel or balled up as malleable iron. The saving claimed by this process is time, labor—the whole process being automatic—and avoidance of flux. The inventors claim that they have discovered a direct way of producing steel with one operation.

A representative of the Lagonda Mfg. Co., of Springfield, O., manufacturer of the Weinland boiler tube cleaner, has been at the Minnequa plant recently, giving instructions as to the operation and care of the Weinland cleaner, of which there are many at the plant. These machines are each operated by a 50 horsepower motor, and are used for the purpose of removing scale from water tube boilers. This scale is a difficult one and one can realize the enormity of this work when it is considered that there are upwards of 200 boilers at the Minnequa plant. At the wire mill the boilers have a water-purifying system, which practically obviates the necessity of cleaning the boilers, but at the furnaces conditions are much more complicated.

The action of the chemicals in the water on the copper bosh plates produces copper sulphate and after the water has been evaporated in the boilers this sulphate is deposited in the tubes and forms a very hard scale. Experiments along the lines of purifying this class of water and finding some method of neutralizing the effects of the copper sulphate are being conducted.

The new blast furnace at the plant is nearly completed, the process of drying out the interior having begun. When blown in, this furnace will nearly double the output of several of the mills which are now running short of steel, and the increase of employes will be considerable. This furnace which is the largest at the plant, was designed nearly four years ago, but has been delayed in construction, and recently all the available structural iron men have been working night and day in an effort to complete this much needed addition to the works.

GERMAN SYNDICATE RENEWED.

A cablegram from Dusseldorf, Germany, states that the German steel syndicate has been renewed for five years. Although it had been generally believed for sometime that the agreement would be renewed, the discussion of the matter has dominated all other subjects in the iron and steel industry in Germany. The agreement expired April 30, and now that it has been renewed, it is expected that all other combinations will be prolonged. These other combinations include the Upper Silesian Steel Syndicate, the Rolled Rod Syndicate, the Ship Building Steel Combination, the Sheet Syndicate and the Gas and Boiler Tube Syndicate. The allotment demands of the Westphalian Steel Works Co., which has hitherto held aloof from the steel syndicate, presented one of the principal obstacles in the way of a renewal of the syndicate. The cablegram does not state whether this company has become a party to the agreement.

EMPLOYES' HEALTH

Will Be Guarded by Manufacturers. —New England Industries.

(Special Correspondence.)

Worcester, Mass., May 4.—A meeting was held in Providence recently by representative manufacturing firms of Rhode Island to inaugurate a plan for the suppression of tuberculosis among employes. A committee was appointed to investigate the subject and to send notices to the various manufacturers suggesting methods whereby a higher degree of sanitary efficiency might be established, the dominant idea being to inaugurate a campaign of education. The Browne & Sharpe Mfg. Co., the American Screw Co., and the Nicholson File Co. were among those represented at the meeting.

The National India Rubber Co., Bristol, R. I., has planned to erect a new insulated wire factory, to employ 500 men, and to cost about $200,000. It will be the largest rubber covered wire plant in the world. It will be two stories, 60 by 450.

The Warren Steam Pump Co., Warren, Mass., will be in the market for machinery, with which to equip its new addition.

The Hamblin & Russell Mfg. Co., Worcester, manufacturer of wire goods, is extending one story of its plant.

When the new plant of the Maxwell-Briscoe Motor Co., at Newcastle, Ind., is completed, the three separate factories, now in use, will move to the new plant at Newcastle. The main plant is now at Tarrytown, N. Y., with one branch at Chicago and one at Pawtucket, R. I.

The Narragansett Machine Co., Pawtucket, has petitioned the general assembly for permission to increase its capital stock, the object being to build two additions at once. One will be to the building where steel lockers are made, 60 by 140 feet, one-story. The other will be 30 by 90, two stories, for storage use. Changes will also be made in the boiler room.

The J. M. Carpenter Tap & Die Works, Pawtucket, is putting up a three-story brick addition, of mill construction, 65 by 100 feet.

Plans are completed for extensive alterations and improvements at the Providence plant of the American & British Mfg. Co., which will add to the city one of the largest and most modern iron and steel working plants in Rhode Island. The old wooden structures composing the plant of the Corliss Engine Works will be replaced by modern buildings, equipped with the latest improved machinery. The foundations for the new buildings are nearly completed.

Four buildings will be erected, consisting of the transfer shop, the main machine shop, the foundry and the erecting shop. The transfer shop will be 44 by 418 feet, the main machine shop 108 by 336 feet, the erecting shop 50 by 364 feet with a lean-to 24 feet wide extending the entire width of the building. The foundry will be 138 x 193 feet. The aggregate floor space of these four buildings will be 99,514 square feet, which will increase the present floor space about 50 per cent. The machinery in the old machine shop will be put into the new building and the old shop used for lighter class of work. This change concentrates the work on one floor, with a corresponding saving in time and expense. The present stationary cranes are to be replaced by electric cranes. The contractors are under bond to have the buildings ready for occupancy by July 15. This company make the old Corliss engine, the American Diesel Oil engine and the Wilkinson steam turbine. It also operates a plant at Bridgeport, Conn., where it makes ordnance, projectiles, fuses, etc. The gross earnings of the company for 1906 are over $1,700,000, which is an increase over 1905 of over $700,000.

Work has begun on the two additions of the Manufacturers Foundry Co., Hartford, Conn. They will be 41 by 170 and 50 by 116, with one-story wing 25 by 170 and 21 by 170 respectively. The construction will be of concrete and steel.

Work has begun on an addition, 18 by 80 feet, to the plant of the Middletown Silver Co., Middletown, Conn.

The contract has been let for the construction of a reinforced concrete factory for Harvey Hubbell Co., Bridgeport, Conn., manufacturer of machine screws and specialties. The building will be 50 by 114 feet, four stories.

The Bristol Brass Co., Bristol, Conn., is receiving estimates for the erection of an addition to its rolling mill in East Bristol. Plans call for a one-story structure, 75 feet square.

The Hart Mfg. Co., of Hartford, Conn., maker of electric switches and supplies, has had plans drawn for an additional factory, three story, brick, 60 by 252.

At the annual meeting of the Putnam Machine Co., Fitchburg, Mass., held April 24, the following officers were elected: Directors—Charles T. Crocker, George R. Wallace, Frederick F. Woodward, Gilbert F. Parks, Henry O. Putnam, Charles F. Putnam, Salmon W. Putnam. The directors elected Charles F. Putnam president, Salmon W. Putnam vice president, Henry O. Putnam clerk and treasurer, and F. F. Woodward auditor.

INDIANAPOLIS MEETING A. S. M. E.

The program for the Indianapolis meeting of the American Society of Mechanical Engineers, May 28-31, has been issued, as follows:

Opening session, Tuesday, May 28, 9 o'clock p. m., in the Claypool hotel. This session will be followed by a social reunion.

Second session, Wednesday, May 29, 9:30 a. m., annual business meeting, reports of the tellers and standing and special committees.

Report of the committee on standard proportions for machine screws.

Preliminary report of the committee on refrigerating machines.

The following papers will be presented:

"Collapsing Pressures of Lap-Welded Steel Tubes," Reid T. Stewart; "The Balancing of Pumping Engines," A. F. Nagle; "A Comparison of Long and Short Rotary Kilns," E. C. Soper.

Wednesday, May 29, visits to various plants.

Third session, Wednesday evening, 8:15; this session will be an automobile symposium, the following papers being presented: "Bearings and Moving Mechanism," Henry Hess; "Air Cooling of Automobile Engines," John Wilkinson; "Materials for Automobiles," Elwood Haynes; "Special Auto Steel," T. J. Fay; "Railway Motor Car," B. D. Gray.

Fourth session, Thursday morning, May 30, 9 a. m.; this session will be devoted to superheated steam, and the following papers presented:

"The Specific Heat of Superheated Steam," A. R. Dodge; "The Flow of Superheated Steam in Pipes," E. H. Foster; "Co-relation of Furnace and Superheating Conditions," R. P. Bolton; "Valves and Fittings for Superheated Steam," J. H. Berryman; "Use of Superheated Steam on Locomotives in America," H. H. Vaughan.

Thursday afternoon, May 30, will be devoted to an excursion, and a reception will be held Thursday evening at 9 o'clock.

The fifth session, Friday morning and afternoon, May 31, will be held at Purdue university, Lafayette, Ind., the professional session being held at 10 a. m., in one of the university buildings, the following papers being presented: "The Performance of Cole Superheaters," W. F. M. Goss; "Experiences with Superheated Steam," G. H. Barrus, "Superheated Steam in an Injector," S. L. Kneass; "Determination of Entropy Lines for Superheated Steam," A. M. Greene; "The Heating of Store Houses," H. O. Lacount.

MANY PLANTS

Will Receive Visitors During the Week of the A. F. A. Convention.

Final preparations for the national convention of the A. F. A., May 20-25, were discussed at the monthly meeting of the Philadelphia Foundrymen's Association, which was held in the Manufacturers' Club on May 1. Dr. E. E. Brown, chairman of the entertainment committee, reported that many meetings had been held and the details practically perfected. The entertainment program will be carried out substantially as already published, including a smoker in Seelee Temple and a high-class vaudeville performance, a trip on the Delaware river, inspection of the shad fishery at Washington Park, and a planked shad dinner there. At the same time with this last the ladies accompanying delegates will be taken to Atlantic City and entertained there, and visiting foundrymen will have the option of taking part in either entertainment they prefer. In this way it is expected to relieve the crush on the boat and at the dinner which would naturally result from an attempt to entertain all the visitors together. Everything, Dr. Brown reported, pointed to a large crowd and a most enjoyable affair. The association voted $500 to the committee, and the Foundry Foremen's Association added $2,000. In all it is expected to raise $7,000 or $8,000, most of which is now in hand.

Speaking of the plans made for visits to various industries, George C. Davis reported that many large plants were too busy to throw their doors open to crowds, but that all who came would be welcomed by the Link-Belt Engineering Co., Bement, Niles & Co., the Camden Iron Works, the Enterprise Mfg. Co., the University of Pennsylvania Engineering Department, the Warwick Iron & Steel Co., and J. W. Paxson & Co. Various steel casting and gray iron plants will be glad to receive limited numbers of visitors, for whose coming special arrangements will be made.

Charles James, general manager of the Sterlingworth Railway Supply Co., of Easton, and the Nelson Valve Co., of Wyndmoor, Pa., represented by W. J. Spencer, were elected to membership. The technical paper of the evening was read by J. M. Sheeler, of the Sheeler-Hemsher Co., on "The Oil-Melting Brass Furnace vs. the Sheeler-Hemsher Coke-Melting Crucible Furnace."

The Pawtucket Mfg. Co., Pawtucket, R. I., is building three one-story buildings for storage purposes, 24 by 40, 72 by 40 and 112 by 40 feet, respectively.

HIGH MARK

Set by Pennsylvania Steel Co.'s Earnings and Surplus.

A new high record for earnings and surplus was established by the Pennsylvania Steel Co. for the year ending Dec. 31, 1906. The net earnings reached the sum of $5,968,451, an increase of $704,486. The final surplus was $1,980,237, a gain of $447,025 over the preceding year despite the fact that the preferred dividend called for $1,653,000, an increase of $489,000. The combined income account for all subsidiaries for 1906 was as follows:

	1906.	1905.	Increase.
Net earnings	$5,462,983	$4,986,248	$476,735
Other income	505,468	277,717	227,751
Total income	$5,968,451	$5,263,965	$704,486
Interest, etc.	821,843	811,562	10,281
Balance	$5,146,608	$4,452,403	$694,205
Depreciation	1,513,371	1,755,191	†241,820
Surplus	$3,633,237	$2,697,212	$1,036,025
Pfd. dividend	1,653,000	1,164,000	489,000
Surplus	$1,980,237	*$1,533,212	$447,025

* Entire surplus over preferred dividends was transferred to reserve for future plant improvements. † Decrease.

The general balance sheet May 1, 1907, shows total assets of $27,787,594, compared with $27,646,995 on May 1, 1906.

President E. C. Felton of the company, in his general report to the stockholders, says in part:

"Reference was made in the last annual report to the formation, in your interest, of the Penn-Mary Coal Co. and the purchase by it of a large acreage of coking coal. This property, situated in Indiana county, Pa., was taken over on May 1, 1906, and is now producing about 30,000 tons of coal monthly. It is being further developed by opening new mines and by the construction of an additional coal tipple. The scarcity of effieient miners and laborers has retarded its development considerably. In line with the policy of increasing ore reserves, your subsidiary company, the Pennsylvania Steel Co., of Pennsylvania, purchased during 1906 6¼ additional shares in the Cornwall Ore banks, and now owns a majority interest in that property. A notable addition to your supplies of iron ore has also been made by your subsidiary company, the Spanish-American Iron Co. During the last three years explorations have been carried on systematically by that company in various parts of the island of Cuba, and these have resulted in the discovery of an extensive deposit of iron ore, which has been acquired, and which will be developed as fast as circumstances permit. The development will involve the building of a railroad, with the necessary ore docks, towns, shops and mining equipment, and if it is to be made rapidly and economically, will require to be financed independently of the current surplus earnings available for plant additions and improvements. The producing mines of the Spanish-American Iron Co., near Santiago, in the island of Cuba, made their maximum output in 1906. These mines are in excellent condition.

"The amount of steel produced by the manufacturing companies and the value of products invoiced were in excess of those for any previous year; 809,000 tons of pig iron were made in 1906, as compared with 748,000 tons in 1905, and 980,000 tons of steel ingots in 1906, as compared with 847,000 tons in 1905. At the Steelton plant of the Pennsylvania Steel Co. the 120 by-product coke ovens were completed with the year 1906, were started in January, 1907, and are now in full operation. The construction of a new open-hearth plant, consisting of five 75-ton furnaces, was begun in June, 1906, and will be completed about the middle of the present year. Important additions were made during the year to billet mill and slabbing mill at Steelton, and to the ore and copper concentrating plants at Lebanon. The marine department of the Maryland Steel Co. built ten vessels during 1906, and also did an amount of repair work to ships about equal to previous years. The railroad companies, owned or controlled, were successfully operated during the year.

"The subsidiary companies expended during 1906, $2,328,590 for capital account. The principal items for which this expenditure was made were the completion of the coke oven plant and the construction of a new open-hearth plant at the Steelton works. The program for the year 1907 comprises no important expenditure at the Steelton works other than that involved in the completion of the new open-hearth plant now under construction. At the Sparrow's Point plant improvements in the handling of raw materials for blast furnaces, from ships to the blast furnace plant, are contemplated. The most important matter now before your management is the development of the new iron ore property in Cuba belonging to the Spanish-American Iron Co. This is a subject of supreme importance to your company, and the plans for developing the property and for financing the enterprise are now having the earnest consideration of your board.

"The business outlook for the year 1907 is good. The amount of orders booked by your subsidiary companies is in excess of any previous year. The increase in the cost of labor and raw materials will, however, considerably reduce their net profits."

Open Shops Listed.—The American Foundrymen's League, Syracuse, N. Y., has issued in neat form a booklet containing a list of 838 open and non-union foundries in the United States and Canada, all classified by states and provinces. The work is by far the most complete ever published. The organization conducts a free bureau for the joint benefit of its non-union molders and its members. The officers are: E. C. Stearns of E. C. Stearns & Co., Syracuse, N. Y., president; Edward Gurney of the Gurney Foundry Co., Toronto, Can., vice president; J. B. Jones, of the Utica Heater Co., Utica, N. Y., treasurer; William Sleicher, of Troy, N. Y., secretary.

THE APPLICATION OF THE CENTRIFUGAL DUST COLLECTOR TO THE BLAST FURNACE.

By Frank C. Roberts.

The removal of dirt and dust from the waste gases of the blast furnace has occupied for some years the serious attention of those interested in the manufacture of pig iron and has assumed an increasing importance as the requirements of economical production become more severe. But little attention was paid to the lack of efficiency in stoves and boilers and to the cost of labor in cleaning these parts until, through the introduction of fine ores and hard driving, these features became important elements in the cost of production. The comparatively recent application of furnace gases to the gas engine has further accentuated the necessity for dust removal until today the problem is one of the most serious confronting the progress of the iron industry.

The development of gas cleaning devices has been gradual. Beginning with various modifications to the interior of the dust catcher at the foot of the downcomer, it was a natural step to introduce additional dust catchers and pockets in the gas mains; these devices were more or less effective in the removal of the coarser dirt, but the finer dirt or dust still remained in suspension and was carried by the gases and deposited in the stoves and boilers. The solution of the problem then spread out along the line of gas washing as supplemental to the dry dust catchers. This development first took the form of a water spray, but it was found that the quantity of water required to reduce the temperature of the gases to a point where they would not take up moisture was so great as to be prohibitive from the standpoint of economy when considered in the light of advantage to hot blast stoves and boilers, for at that time the gas engine had not reached its present state of development. As a rule, these spray washers were equipped at the bottom with a water pan and it was found upon shutting off the sprays and providing a water supply at or near the bottom, that improved results were secured by allowing the gases to impinge on the surface of water contained in these pans, whereby much of the fine dirt was retained by the water and discharged through a water sealed overflow. This led to various developments of the water pan both by itself and in combination with the dust-catcher, resulting in various degrees of satisfaction but still leaving much to be desired.

During all these stages of development it was generally admitted that the use of water was disadvantageous in that it

involved loss of sensible heat, absorption of moisture and much difficulty in the disposal of the accumulated dust, owing to its wet and sticky condition; all of which would be avoided by the use of a dry process of separating the dust from the gases. Some years ago, the writer directed his attention to the separation of dust by means of centrifugal force and through the interest of Mr. B. Dawson Coleman certain experiments were conducted by him and the writer's firm at the Lebanon furnaces. It was feared at the outset that in order to secure the velocity of gases necessary for separation it would be impossible to utilize the gas pressure due to the furnace without restricting the openings to such an extent as to increase the furnace top pressure beyond a desirable point. The first experiment therefore involved the use of a fan having a chamber enclosed by an outer casing for the collection of the dust with openings leading thereto through the usual casing, from the wheel space of the fan. The results were not satisfactory, however, and the apparatus was also objectionable in that it involved the use of power other than that furnished by the pressure of gas. We therefore returned to the original idea of adopting the device so generally used in wood working plants and known as the "centrifugal dust collector," "cyclone separator," etc., and determined to make an experiment depending upon the pressure of the gas for the power required. A small experimental collector was first constructed and, the result proving satisfactory, a larger one was built and connected to one of the fire brick stoves in such manner that all the gas for this stove was passed through the separator. This separator was in use for several months with the result that Mr. Coleman decided to install a collector large enough to take care of all the gases from his No. 1 furnace. After the latter collector had been in use for upwards of a year, the No. 3 furnace at this plant was equipped in like manner. In consequence of the experience at the Lebanon furnaces, the centrifugal type of dust collector has been installed at a number of furnace plants with extremely satisfactory results in all cases. It is found that, after passing through the collector, the gases contain but a small quantity of finely divided dust of a character that does not fuse in the combustion chambers of either the stoves or the boilers, a condition which renders trifling the expense of cleaning these parts.

As evidence of the character of the dust extracted from furnace gases by these collectors the following tests are submitted, being the results of samples taken from collectors in actual daily use.

Retained on 30 mesh sieve	5.25 per cent
Retained on 50 mesh sieve	2.00 per cent
Retained on 100 mesh sieve	8.30 per cent
Passed through 100 mesh sieve	84.45 per cent

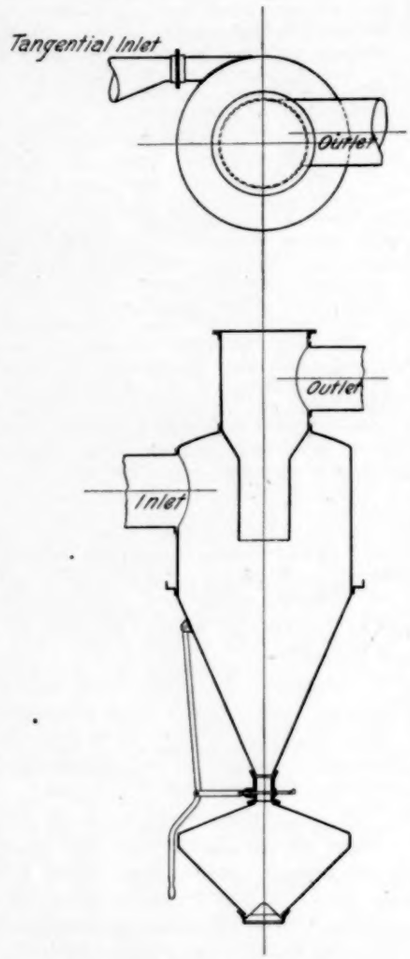
It is interesting to know that the flue dirt taken from the ordinary dust catcher at the bottom of the downcomer of the same furnace gives the following results:

Retained on 50 mesh sieve	55.40 per cent
Retained on 80 mesh sieve	19.00 per cent
Retained on 100 mesh sieve	7.20 per cent
Passed through 100 mesh sieve	18.40 per cent

The flue dust taken from the collector at another furnace gives the following results:

Retained on 40 mesh sieve	0.50 per cent
Retained on 60 mesh sieve	2.70 per cent
Retained on 100 mesh sieve	8.90 per cent
Passed through 100 mesh sieve	87.89 per cent

When it is realized that a 100-mesh sieve contains 10,000 openings to the square inch, the fineness of the dust removed from the gases by this form of collector is appreciated.



CENTRIFUGAL DUST COLLECTOR.

So far the installations have comprised single collectors placed in the line of the gas main; it would appear, however, that if two or more collectors were placed in series arranged so that the gas would pass through them successively, the results would be still more satisfactory.

It is believed that the centrifugal type of dust collector is the most satisfactory solution yet attained of the problem of cleaning gases for use in stoves and boilers and that it will be found to be the most desirable method of preliminary treatment of gas for use in gas engines. Two or more centrifugal dust collectors in series would very materially reduce the work to be performed by washing.

The writer is informed that some years ago Mr. Jas. P. Witherow built at one or more furnaces in Virginia, a dust collector in which the centrifugal feature was utilized. Apparently the results secured were not such as to warrant the adoption of the apparatus, since it was not embodied in plans constructed subsequently by Mr. Witherow. The recent development of the centrifugal form of dust collector has, however, led to a revival of the Witherow construction.

The design and arrangement of the centrifugal dust collector which, in our experiments, has proven the most satisfactory is that shown in the accompanying illustration. It is to be noted that the gas inlet is tangential to the collector and that the outlet is centrally located at the top of the collector. Below the collector proper is placed a pocket into which the dust is discharged from the collector; this pocket is necessary in order to remove the dust which has been separated out of the path of the whirling gases. The contents of the pocket are discharged through the bottom by lowering a bell counterweighted to normally keep the outlet closed. In order to prevent the entrance of air into the collector when the bell at the bottom of the pocket is lowered, a valve is placed between the collector and the pocket; this valve is closed when the pocket is being discharged of its contents, but at other times is open in order to permit the free passage of dust into the pocket. Under certain conditions the whirling gases within the collector create a vacuum at the center of the dust discharge opening, thus inducing air to enter the collector; it is evident that the closing of the valve between the collector and the pockets prevents the entrance of air when the pocket is being discharged.

As a rule the dust collector is located over a railway track whereby the contents of the pocket may be discharged directly into a railway car; the dust is dry and is therefore handled at a minimum cost.

These collectors are constructed under a patent granted to W. L. Wallis.

The Carpenter Steel Works at Reading, Pa., has started up No. 6 crucible furnace. This is the largest in the plant.

THE BLAST FURNACE=III.

By Horace Allen.

The different changes in the working conditions, mentioned in article II, are readily understood owing to the fact that they do not become apparent until many hours have passed, while changes brought about by alterations to the supply of blast, and its temperature, are very shortly evident in the well of the furnace; others due to charging the materials, their mixture and condition, are not detected for several hours; and owing to this, whenever it is desired to make any change in the class of iron produced the alteration to either the proportions of the charge, or the temperature or volume of the blast must be carried out gradually with great care.

In one instance, where a furnace that was making gray iron, was required to produce white irons the temperature of the blast was reduced to about 550 degrees Fahr. and the burden was altered from 4,700 pounds to 5,000 pounds, with the result that the furnace became gobbed up in the course of a shift or so. This had to be rectified by again reducing the burden and regulating the weight of the ore per charge gradually.

In 1867 raw coal was employed for heating the blast, but then only cast iron pipe stoves were in vogue; the application of furnace gases for this purpose followed with economical results, and later fire brick regenerative stoves were introduced with still further economy.

However, the discovery in 1894 by B. H. Thwaite, that the furnace gas employed to raise the temperature of the blast could be turned to much better account, if it was purified and employed to develop power in gas engines, again raises the question as to whether it would not result in increased economy if the stoves were to be heated by gas made from common coal slack gasified in ordinary gas producers, and the furnace gas reserved for generating power if an outlet in this direction should be available.

The controlling features in this direction are that when furnace gas is used for heating stoves, without purification, the effect of the dust carried by the gas and deposited upon the surfaces provided by the checker work of the stoves, reduces the conducting power of the fire brick, while with producer gas carbonaceous and tarry matter would not have the same effect; this deposit being readily burnt off at intervals.

Besides reducing the stove capacity required to be provided for a furnace, the average heat of the blast would be better maintained; standby stove capacity would be reduced, and the producers would be available to provide gas for the gas engines during any interval when the furnace gas supply was reduced through the blast supply being shut off from the furnace. As it is not possible to satisfactorily employ furnace gas for power purposes in gas engines without an efficient cleaning apparatus, when it is required to use the producer gas to carry on the power requirements, it would require to be passed through the same cleaning plant.

Whatever may be the lines of the furnace, the class of ore, and richness; the purity and physical condition of the coke, either from the bee hive or retort ovens, the quantity and quality of the flux, the produce of iron is dependent upon the weight of air infused into the furnace hearth.

It may surprise some furnace managers to know that the above statement has not been common knowledge to many occupied for numbers of years practically managing blast furnaces, but it is a fact all the same.

As proof of this, when some English iron masters became aware that higher blast pressure was being employed in the United States than was common practice in the old country, some of them made the experiment of increasing the pressure of the blast by reducing the area of the nozzles of the tuyeres, but were disappointed to find that there was no increase in the output of pig iron. If instead of this they had provided more blowing power, and had forced more air into the furnace, whether the pressure was increased or not, they would have found that the output was also increased.

Following this a further error was made by some iron masters when considering the installation of new blowing engines. It is a common thing just now to hear of a blowing engine being installed which is capable of supplying blast at a pressure of about twice its normal working pressure, and also to run at about 10 per cent above the normal speed. The most suitable pressure of blast for a given furnace depends upon the character of the ore, fuel and flux; and the height of the stock, and this pressure must be maintained constant for a given quality of iron. A blowing engine to work normally at 10-12 pounds pressure and 45 revolutions per minute, but capable of running at 50 revolutions per minute and to work to a pressure of 15 pounds per square inch when required, would necessitate all the parts of the engine, as well as the tubing, stove casings, etc., being made of twice the strength required for normal conditions, a very costly provision. Should this engine at any time have to deliver blast at 15 pounds the normal conditions of the furnace would be upset and the zone of highest temperature would be concentrated in the neighborhood of the tuyeres; this condition of things would have to be cut down to the shortest possible period, so that under normal conditions the installation would be considerably under loaded. There are other methods of removing scaffolds and obstructions in a furnace, which are more economical, in first cost and interest, depreciation, etc.

The old English practice was to have one or more blowing engines forcing air into tubing carrying weighted safety valves which relieved the pressure whenever it exceeded the normal requirements and in this case the supply of blast was kept as constant as was possible. Later practice was to provide each furnace with its own blowing engines so that the supply of blast would be under better control. It is unnecessary to dwell longer on this matter, but there is one point which does not seem to have received the attention it merits; sufficient care is not taken in the avoidance of suddenly changing the direction of the blast tubes between the blowing engines and the furnace. Frequently elbows are employed where long-radius bends could be introduced, with the result that much of the work of the engine is expended in overcoming resistance due to the friction in the piping; of course the passage of the blast through the stoves and hot blast main is tortuous, but while this cannot well be avoided, it is bad practice to add to this loss by employing elbows where bends could be substituted, even at a somewhat extra cost in the initial installation.

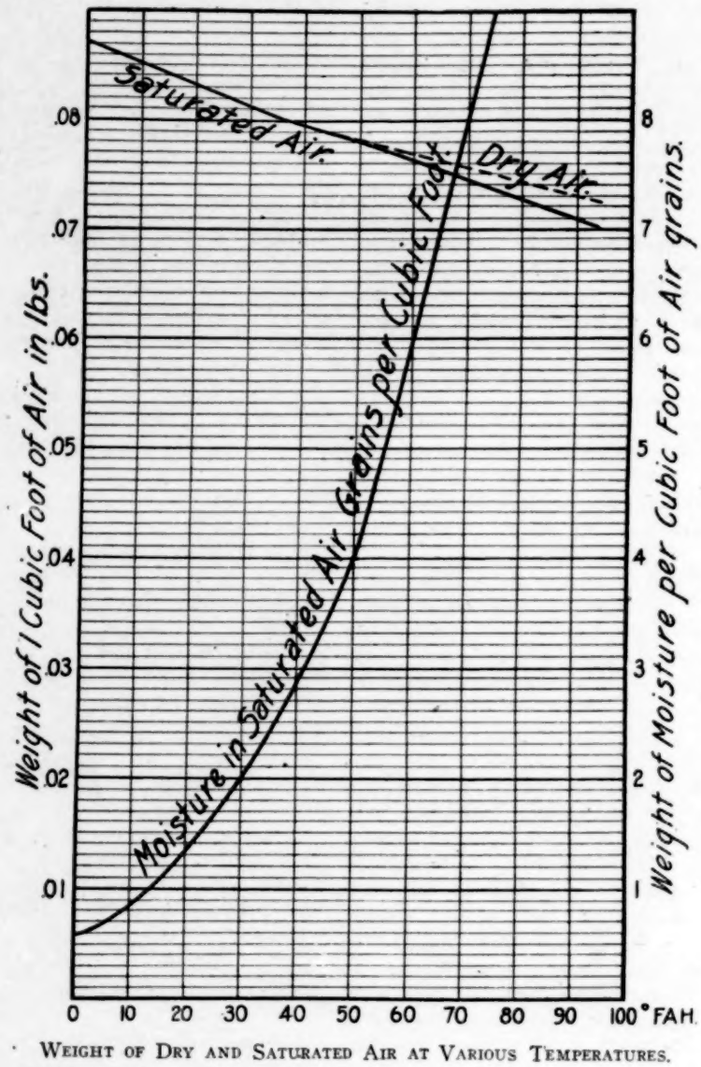
As a blast furnace is to produce a constant quantity of iron, it is imperative that all the items relating to smelt-

Note.—The previous articles of this series appeared in The Iron Trade Review on March 14 and April 11, 1907.

ing must also be constant, even when the mixture of ore, fuel and flux is maintained as near as possible of average quality, and the temperature of the blast only varying to a slight degree through the provision of ample stove capacity, it is also necessary that the operation of introducing the charge into the furnace should be maintained as constant as possible to keep the stock line of the furnace as near as possible regular. Although charging takes place with fair regularity during certain periods of the day and night shifts, there is frequently a long interval during which charging is suspended at the changing of shifts. The fall of the materials in the furnace is not always regular and at times the new charge cannot be introduced at the usual period owing to this, but at other times the descent of the charges is more rapid than usual and the stock line becomes low. The effect of these irregularities is not immediately recognized and the change in the quality of the slag and iron several hours later may not be attributed to the right cause.

Another contributing cause of irregularity in smelting is the want of uniformity in the air blast, due to atmospheric changes in temperature and the amount of moisture carried at different periods.

This has been strikingly evidenced by the results of James Gayley's experiments upon drying the air previously to its introduction into the blowing cylinders.



WEIGHT OF DRY AND SATURATED AIR AT VARIOUS TEMPERATURES.

The curves given on the diagram show the variation in the weight of dry and saturated air, and the weight of moisture carried by saturated air for different degrees of temperature between 0 degrees and 100 degrees Fahr.

Keystone furnace of the Reading (Pa.) Iron Co., was blown in April 26.

DIAGRAM OF THE PROCESSES AND PRODUCTS OF IRON AND STEEL MANUFACTURE.

BY ALBERT SAUVEUR.

Many text books on the metallurgy of iron and steel contain diagrams in which attempts are made to group the various processes and the resulting products in such a way as to indicate in a concise manner the relation they bear to each other. The usefulness of such attempts is not to be denied but none of these diagrams appear satisfactory.

The accompanying scheme seems to possess some valuable features. The diagram calls for little explanation. It will be found to yield the following information:

(1) The various processes represented by circles.

(2) Distinction between the obsolete processes or at least those not in use in the United States from those in use by representing the former ones by dotted and the latter by full circles.

(3) The nature of the various processes briefly stated within the circles.

(4) The dates of the invention of the processes also indicated in the circles.

(5) The products resulting from each process represented by rectangular areas placed immediately below the corresponding circles.

(6) Subdivision of the products from any one process according to their further treatment, or according to their character.

(7) The further treatments of the products indicated by arrows leading to the proper circles.

(8) The relative outputs of the various products for the year 1905 in the United States by making the rectangles proportional to the tonnages, for that year.

(9) The actual tonnage of each product indicated by figures within the rectangles, the unit being 1,000 gross tons.

The origin of the blast furnace has been assigned to the 13th century as this seems to be the most probable date, but it should be borne in mind that there is considerable uncertainty as to the exact time at which the blast furnace came into existence, meaning by blast furnace a shaft furnace in which molten cast iron alone could be produced and not those high bloomary furnaces or stückofens of considerably earlier date and in which both wrought iron and cast iron could be obtained at will by suitable variations in the working.

The date of the origin of the finery furnace has also been indicated as being the 13th century on the assumption that the finery furnaces for the refining of cast iron must have been introduced

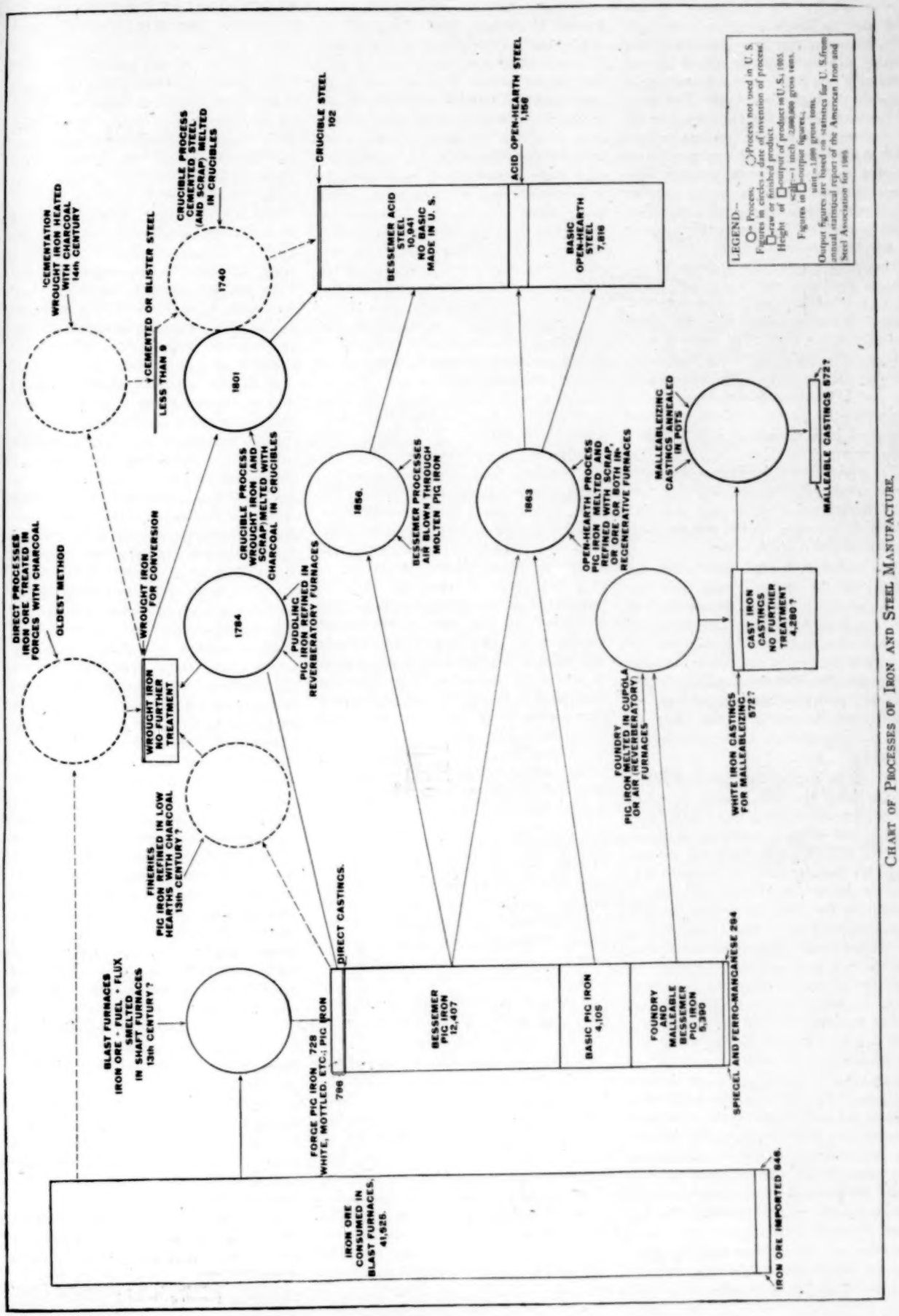


CHART OF PROCESSES OF IRON AND STEEL MANUFACTURE.

very soon after the production of cast iron in blast furnaces. It is quite possible, however, that they were used at a considerably more remote period for the refining of the cast iron occasionally produced in the high bloomaries. The dates of the invention of the puddling process, of the original crucible process, of the Bessemer process and of the open-hearth process are known with certainty, but there is some doubt as to the date at which the cementation process was first used and which is given in this diagram as the 14th century.

Figures indicating the tonnage of the various products and their sublivision were obtained from the annual statistical report of the American Iron and Steel Association for 1905. The upper part of the cast iron block indicates the output for that year of forge, white and mottled pig and it has been assumed in the diagram that the totality of these irons was converted into wrought iron by the puddling process.

The dotted arrow leading to the finery circle simply indicates that this is a possible process of refining cast iron but that it is not used at the present time, at least in the United States.

It is indicated in the diagram that the totality of the Bessemer pig iron produced was refined in the Bessemer or in the open-hearth furnace, it being of course understood that the great bulk of it is treated by the Bessemer process. Since the basic Bessemer process is not used in the United States it has been assumed that the whole of the basic pig iron had been refined in the open-hearth process.

The lower part of the cast iron block, leaving aside the very bottom indicating the production of spiegel and ferro-manganese, and which is made up chiefly of foundry and malleable Bessemer is treated in the foundry either in a cupola furnace or in an air furnace yielding as shown in the diagram either finished cast iron castings or white cast iron to be malleablized. The area representing the finished iron castings represents 90 per cent of the foundry pig iron indicated in the report, it having been assumed that the whole of the foundry pig iron was used for this purpose and a loss of 10 per cent allowed. No doubt the use of scrap in the cupola would increase the size of this block but in the absence of statistics no attempt has been made to estimate it. Likewise the area indicating the white castings for malleablizing represents 90 per cent of the total malleable Bessemer pig iron reported in the statistics. The area representing the finished malleable castings has been made the same as that representing the white castings before annealing as there should be little or no loss in the process.

Accurate figures concerning the production of wrought iron cannot be obtained but the report of the American Iron and Steel Association gives a total amount of finished wrought iron products exceeding 2,000,000 tons and the size of the wrought iron block is in accordance with that output. It should, however, be borne in mind that probably a very large proportion of these wrought iron products was obtained by the piling and welding of scrap iron. It would be interesting to know the actual contribution of the puddling furnace to this block. The double line at the top of the wrought iron block indicates that wrought iron can be used for cementation but as this process is not used in the United States the arrow leading to the circle is dotted and the production of cemented or blister steel indicated by a line. The association in its report states that 8,963 tons of blister and patented steels were produced in 1905.

While the blocks representing the various products have been made proportional to the outputs for 1905, the diagram should have a permanent value because of the logical grouping of the processes and products. Again while the actual size of the various blocks should vary from year to year their relative proportions will probably vary little. The iron ore block for instance will always remain about twice the size of the cast iron block while the latter will continue to exceed by some 10 to 20 per cent the steel block. Again the size of the cast iron castings block will probably continue to measure from 1-6 to ¼ the size of the total cast iron block and the relation of the wrought iron block to the cast iron one will probably not vary greatly. In the relation of the areas representing the production of Bessemer pig iron and of basic pig iron and in the subdivision of the steel block considerable change may occur due to the probable greater increase in future years of open-hearth steel production as compared to the increase of Bessemer steel.

The diagram was drawn and the details worked out by Mr. H. M. Boylston of the department of mining and metallurgy of Harvard university.

Ordered to Sell.—P. E. Slaymaker and C. C. Kauffman, receivers for the Susquehanna Iron & Steel Co., Columbia, Pa., have presented a petition to the court at Lancaster, Pa., for an order to sell all the property. The court has made an order directing the receivers to sell but has required that a bid of at least $400,000 in excess of the mortgage indebtedness of $300,000, payable May 1, shall be received. The sale will be held on May 31 in Columbia.

ELECTRICALLY-DRIVEN ROLLING MILLS.[1]

By G. M. Brown.

For some years electricity has been largly used in rolling mills for lighting, driving cranes, saws, shears and other auxiliary machinery, including the "live" rollers which carry the work back and forward to the main rolls.

The writer's object, however, is not to discuss the application of electricity to auxiliary machinery in rolling mills, but rather its application to the much heavier and more exacting work of driving main rolls. With this object in view, it seems desirable to begin by considering the mechanical features of the problem, and later to examine the various methods by which electrical driving has been made feasible, practically and commercially.

Small bars and rods are generally rolled down in two-high to three-high mills arranged to run continuously in one direction. Such mills may consist of several stands, or sets of rolls, running in separate housings or frames, and connected together by suitable flexible couplings.

Fig. 1 shows the usual arrangement for driving a set of two-high rolls. In this figure, "A" is the main driving shaft, connected by a flexible coupling to the pinion shaft "B." Two pinions are mounted in suitable housings, and each pinion shaft is connected through muffs and short lengths of shaft (on wabblers) to the rolls. The illustration shows one stand of rolls only, but in the case of mills used for finishing rods and bars there are generally three or more stands, the material being passed through the rolls in the various stands, and gradually reduced to its finished dimensions. Sometimes, of course, different stands of rolls are used for the production of different classes of work. For instance, two stands may be used for rolling square bars, and the remaining stands for producing, at the same time, round or other sections.

In the case of non-reversible, two-high mills, the material is passed through the rolls in one direction, and passed back over the top; but in the case of three-high mills it is passed through two lower rolls and back through the two upper rolls. When long bars are being rolled, a considerable saving of time and labor is thus effected.

Fig. 2 shows a modern arrangement of the pinion housings and couplings for connecting a set of small three-

[1]Abstract of a paper read before the Rugby Engineering Society.

high rolls to a motor. The pinion housing totally encloses the pinions, which run in an oil bath, and the bearings supporting the main driving shaft and fly-wheel are of the self-oiling type. Mills of these two types are in very general use for the production of small and medium sections; but on the continent and in America there are mills of the three-high type for dealing with comparatively heavy sections.

In such mills the rolls require careful adjustment, and are more difficult to arrange satisfactorily than the rolls in ordinary two-high mills, and this and other disadvantages have led to the introduction of the double two-high mills, consisting of two separate sets of rolls, as shown in Fig. 4. All these mills run continuously in one direction, are fitted with heavy fly-wheels, and driven by gas or steam engines, or electric motors.

Considerable fly-wheel capacity is necessary to deal with the heavy and rapidly fluctuating load, and to equalize as far as possible, the demand for power. As engines for this work have to run continuously, at a fairly uniform speed, they may be of an economical type, and are, as a matter of fact, generally tandem-compound condensing engines with automatic valve gear. Gas engines supplied with blast-furnace gas would offer considerable advantages over steam engines as regards economy, but in general necessitate a much greater capital expenditure, for they would have to be capable of carrying at least 100 per cent overload.

Mills for rolling wire and hoop iron are also non-reversible, and similar in operation to those described above. They usually consist of about four stands of rolls of graduated diameters and peripheral speeds. As the wire is threaded through the several sets of rolls and gradually reduced in section, the peripheral speed of the rolls must, of course, be increased in order to avoid the accumulation of material between any given pair.

Mills for rolling steel tubes, wheel tires etc., are generally of special construction, and it is beyond the scope of this paper to do more than merely remark, in passing, that many of them are now driven by electric motors.

Reversible Rolling Mills.

For rolling heavy ingots into billets, beams and rails, two-high reversible mills are very generally used, although it is still considered a very debatable question as to whether the mills for large beams and girders should be two-high or three-high. With the three-high mill, as already pointed out, it is possible to use a very economical type of engine as compared with the simple non-condensing engine generally provided for driving reversible mills. The latter, however, has a considerable advantage, inasmuch that, as the length of the piece is increased, the speed of rolling can be increased likewise.

Reversible rolling mills, it is hardly necessary to say, are not fitted with fly-wheels, but, on the contrary, everything possible is done to reduce the moment of inertia of the system so that the rolls may be started and reversed with the utmost rapidity. The engines are generally controlled by regulating the throttle valve, which is fully open during the acceleration period, which may last for two seconds or more. During this period the whole system is brought from rest to its running speed. At about half-speed the ingot is generally put into the rolls, and before it leaves them, on the other side, the throttle valve is partly closed, and the rest of the rolling operation is performed by the stored energy of the system. As soon as the ingot leaves the rolls, they are quickly brought to rest by reversing the engine. It will be seen that the duty of these engines is very severe; in fact, it is a general rule that their various parts should be from two to three times as strong as those of engines of the same output designed for continuous operation under normal conditions.

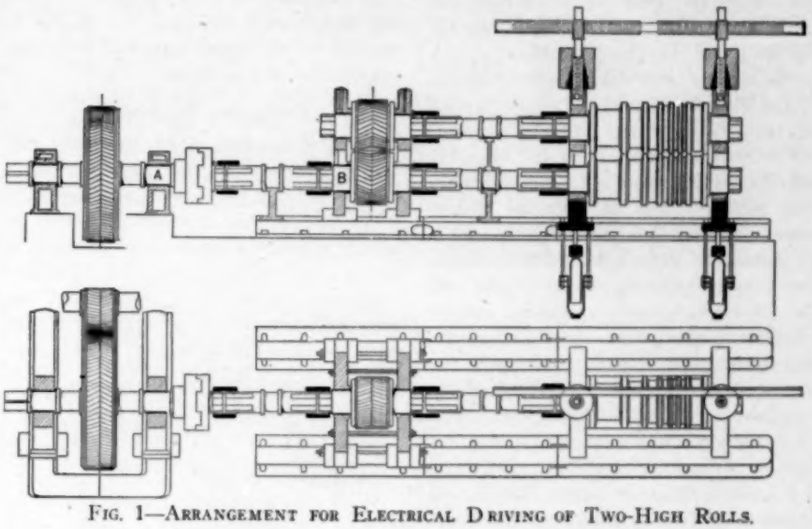


FIG. 1—ARRANGEMENT FOR ELECTRICAL DRIVING OF TWO-HIGH ROLLS.

The Application of Electric Driving.

Evidently an electric motor for this class of work should be easily reversible, and, further, be capable of carrying very large momentary overloads. The motor should also be constructed in such a manner that the moment of inertia of the rotating parts is kept as small as possible, and it should, therefore, be of small diameter and low speed—two conditions which are more or less antagonistic.

The principal difficulty in applying electricity to the driving of rolling mills lies in the determination of the

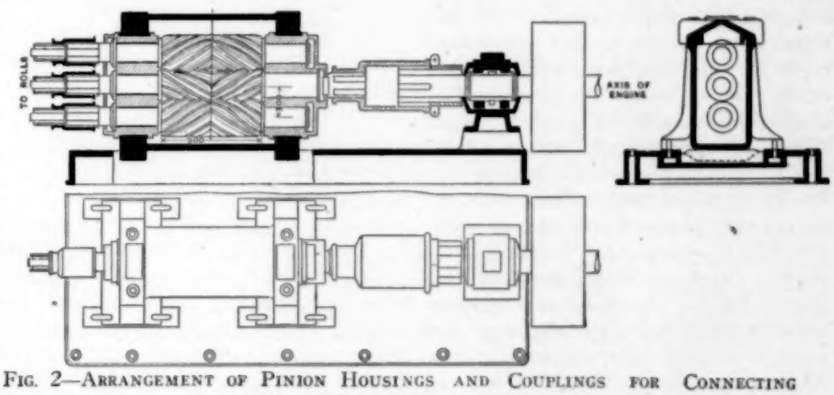


FIG. 2—ARRANGEMENT OF PINION HOUSINGS AND COUPLINGS FOR CONNECTING THREE-HIGH ROLLS TO MOTOR.

power required, and until experiments were carried out especially with this object in view, there were practically no data available, and all that could be done was to install a motor capable of exerting at least the same maximum torque as the steam engine which would otherwise have been supplied.

The first experiments made with this object in view were carried out by A. G. Rote Erde on a non-reversing mill, by carefully indicating the steam engine and taking observations of the fly-wheel speed, the nature of the material worked, and the diminution in sectional area effected. The results of these experiments made it possible to determine the average horsepower required for the reduction of a given weight of material. More complete investigations were made by Herr Kottgen on the blooming mill of the Gate Hoffingshutte at Oberhausen, with the object of determining the energy used to roll material out to various lengths. This mill is driven by a two-cylinder non-condensing reversible steam engine with cylinders 51.2 inches diameter and 51.2 inches stroke. It is connected to the mill shaft by gearing having a ratio of 1 : 2.5, and the maximum speed of the rolls is 55 revolutions per minute. The moment of inertia of the system, and therefore its kinetic energy of any given speed, was determined by calculation. Continuous indicator diagrams were taken, and also complete records of the engine speeds. The results were corrected, and allowance made for the fact that steam is generally shut off before the piece entirely leaves the rolls. The error introduced by neglecting this correction could not exceed seven per cent of the energy required for rolling, so that the results obtained are in any case sufficiently accurate for practical purposes. These results are given in diagram, Fig. 3, abscissae representing the number of times the length of the piece is increased during rolling, and the ordinates the foot-tons per ton required to effect this extension. The curves show the amount of work required by the different classes of steel, and it will be noted that there is considerable variation in steel of the same class. Consideration of the fact that the times required for rolling different sections, and hence the final temperatures, vary considerably, would lead us to expect occasional divergencies from the upper parts of the curves in practice; but such differences do not seriously effect the value of the average horsepower required, because towards the end of rolling the maximum and mean horsepower during each pass are considerably less than the maximum and mean horsepowers required during initial passes. In order to determine from these curves the amount of energy to be expended on the material during each pass, there is evidently required a knowledge of the reduction of section, and therefore the increase of length effected during that pass. In other words, it is necessary to know exactly how the rolls are to be graded.

Designing the Rolls.

The actual design of the rolls involves capital consideration of many questions. In the first place, there is to be decided the number of passes in which a given reduction of section is to be effected, and this naturally depends on the power available and the amount of work it is desired to put into the finished product. The number of passes being determined, the rolls must be designed accordingly, care being taken that the reduction in thickness is effected uniformly over all parts of the cross-section, not only to avoid waste of energy through unnecessary transference of the material from one part of the section to the other, but also the injurious effects of such treatment. Assuming that the grading or calibration of the rolls is given—that is, the reduction of section and increase of length at each pass is determined—the amount of work to be done during the various passes is determined from Herr Kottgen's results. Knowing the speed of the rolls, the time required for each pass can also be determined, and thence the horsepower required at any given instant for rolling. Considerable allowance must, of course, be made for friction, and, in order to determine the actual horsepower to be supplied by the motor at any given instant, the inertia of the moving parts must also be taken into account. This presupposes a knowledge of the construction and dimensions of the rolls and gearing.

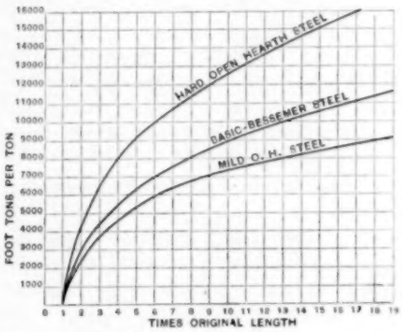


FIG. 3—RELATION OF PRESSURE TO INCREASE OF LENGTH.

In the case of two and three-high mills, the determination of the fly-wheel weight is an essential part of the problem, and one for the solution of which no general rule can be laid down. Such fly-wheels are generally of cast iron, with a peripheral speed of 90 feet to 100 feet per second, and their weight varies from about 0.16 to 0.08 ton per motor brake horsepower. The larger figure applies to small sets of rolls driven by motors up to 100 to 150 horsepower, and the smaller figure to mills driven by motors with normal ratings up to 1,000 horsepower. On account of the widely varying conditions of service, it is impossible to lay down any strict rule, and all that can be done is to select a suitable weight, and then (with due regard to the electrical characteristics of the motor) investigate the variations in the relative proportions of power supplied by the motor and by the fly-wheel respectively. It is evident that to utilize effectively the kinetic energy stored in the fly-wheel, the speed of the motor should fall considerably as its output increases. For small mills requiring motors up to, say, 400 horsepower, it will generally be found that a reduction in speed of about 10 per cent between no-load and full-load will be ample. In the case of direct-current motors this reduction can, of course, be obtained by suitably proportioned compound windings, and in alternating-current motors by inserting suitable resistance in the motor circuit.

One motor is often used for driving both the roughing and finishing trains, in which case the trains are fitted with separate fly-wheels, and the roughing train driven by ropes, while the finishing train is directly coupled to the motor shaft, and then it is necessary to assume that the power required is the sum of the maximum powers required by the two separate trains. For this class of work direct-current motors have been largely used, and in view of the fact that speed regulation is generally required, and also in order to insure satisfactory operation under trying conditions of service, it would seem advisable to make use of either a compensated or interpole machine, the speed regulation being effected by adjusting the shunt field current and the speed decrease required in order to make the inertia of the fly-wheel effective by suitable series field windings. The starting rheostats for such motors may either be of the liquid or metallic type, and suit-

able arrangements should be provided to prevent an abnormal rush of current, either by the use of a slow motion or protective device.

Some Recent Examples.

As an example may be mentioned a small two-high mill with six stands of rolls 8¼ inches diameter driven by a direct-coupled compound-wound continuous-current motor having a normal output of 110 horsepower and a maximum output of 220 horsepower. The speed is adjustable by shunt field regulation from 225 to 350 revolutions per minute. These rolls are used for small work, 1½-inch square bars, generally of tool steel, being rolled to flat, square, round and triangular sections from 0.0465 inches to 0.115 square inch area—the maximum length of the finished steel being 50 feet.

As a further example, there may be mentioned a large direct-current motor driving a plate mill, which consists of one three-high stand of rolls, 2 feet 4 inches by 8 feet long, and one two-high stand with rolls 2 feet 1 inch diameter by 6 feet long—both running at 56 to 90 revolutions per minute. The motor is supplied with current at 500 volts, and has a normal output of 750 horsepower at 250 revolutions per minute, which by regulating the shunt field can be increased to 350 revolutions per minute; the maximum output is 1,500 horsepower. Billets weighing 770 pounds are rolled to plates ½ inch thick by 10 feet long. The motor drives the mill by means of ropes, and the weight of the fly-wheel is 42 tons.

A very large number of small and medium-sized mills have been equipped with alternating-current motors, which are especially suitable for this class of work in cases where the speed need only be regulated within comparatively narrow limits. Such motors are necessarily of heavier construction, and capable of carrying greater overloads than motors of the same normal capacity for continuous service. Starting and speed regulation can be effected either by metallic or liquid resistance, preferably the latter, for motors of more than 200 or 300 horsepower.

Several two-motor aggregates have recently been supplied by the Allgemeine Elektricitats-Gesellschaft for driving rolling mills, one of which drives by ropes to a set of roughing-down rolls consisting of four stands of rolls having a diameter of 1 foot 10 inches, and running at 90 to 105 revolutions per minute. The two motors each have a normal output of 750 horsepower and a maximum output of 1,500 horsepower, their speeds being 167 and 217 revolutions, respectively. Only one motor is used at a time, and intermediate speeds are obtained by means of a liquid regulating rheostat. The two motors are mounted on a bed-plate with three bearings, and connected by a coupling to a rope pulley approximately 11 feet in diameter, provided with two separate bearings. As regards efficiency and ease of manipulation, this arrangement of the motors has proved itself decidedly superior to the so-called cascade connection.

The same firm has supplied a three-phase 2,000-volt 50-cycle induction motor, having a normal output of 1,200

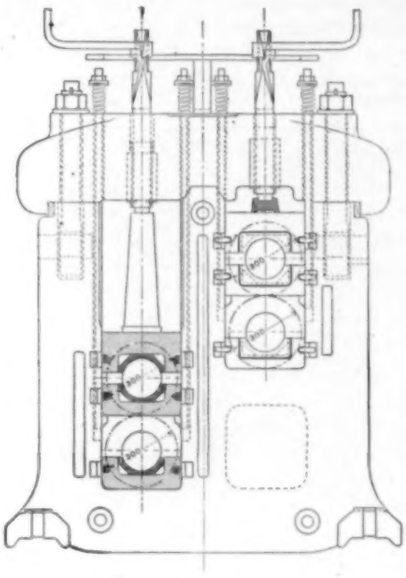


FIG. 4—DOUBLE TWO-HIGH MILL.

horsepower, at a speed of 130 revolutions per minute, and a maximum output of 2,400 horsepower, for driving a set of one stand of roughing rolls 24 inches diameter at 100 revolutions per minute, and a train of three stands of finishing rolls 1 foot 8 inches in diameter at 110 revolutions per minute. The motor is directly coupled to the finishing train, which is provided with a fly-wheel weighing 22 tons, and connected by ropes to the roughing rolls, which are provided with a fly-wheel weighing 33 tons. Billets weighing from 800 to 2,200 tons, and up to 8 inches square, are rolled into channels and girders up to 8 inches deep by 130 feet long, and also into tram rails for mines and sleepers.

Both the roughing and finishing trains are of the three-high type, and this is one of the largest electric motors that has so far been applied to this class of work.

The problem presented to the electrical engineer by the heavy reversing mill is much more complicated. In the first place, the power required is generally much greater, and, as previously mentioned, steam engines of a very large size are generally installed. Except that these powers are considerably greater than are required for electrical winding in collieries, and that acceleration and retardation must be much more rapid, the difficulties which present themselves are practically the same, and have been solved in the same manner. Herr Karl Ilgner, to whose enterprise recent advances in both fields are principally due, first carried out tests which proved conclusively the possibility of driving reversing rolling mills electrically.

Determination of Power Required.

In calculating the power required to drive a reversing rolling mill, it is necessary to make certain assumptions as to the methods of working, and, as already mentioned above, particulars of the grading or calibration of the rolls proposed must be available. The assumptions generally made are:

(1) That acceleration from zero to full speed takes place in a certain time varying from two to five seconds.

(2) That when half speed is reached, the material is put into the rolls.

(3) That current is shut off from the motor and the rolling continued by the kinetic energy of the moving parts; so that the material leaves the rolls at half speed.

(4) It is necessary to allow a certain time for stopping the rolls and moving the billet or bar into position for the next pass. This interval will vary from three to five seconds, and a longer interval must be allowed when it is necessary to move the material from one stand of rolls to the next.

Having settled these matters and the speeds at which the various passes are to be made, a speed diagram can be constructed. Then, from a knowledge of the roll calibration and hence of the reduction in sectional area of each pass, and with the aid of the results given in Fig. 3, the total work done on the material during its pass is easily determined, and curves showing the horsepower required at any instant for rolling alone, can be drawn. To the powers so obtained, there must be added the powers required for acceleration and to overcome friction, in order to determine the actual output of the motor from moment to moment. The next step in the calculation is to determine the armature current of the motor from a knowledge of its electrical properties, then, after making due allowance for losses, the voltage re-

quired, and thus the output of the motor-generator. From these results the dimensions of the fly-wheel, the maximum and average loads on the motor of the motor-generator set, and the amount of speed decrease it is desirable to allow between no-load and full-load, can be determined. The two latter items naturally depend, to a great extent, on the capacity of the power station generating plant and the degree of equalization aimed at for the heaviest sections the mill will have to produce. If the mill is to be used for producing billets, slabs and blooms, as well as large girders and channels, calculations should be made for both classes of work.

A Reversible Electrically-Driven Mill.

The only reversible electrically-driven mill in operation so far is that installed at the Erzherzogliche Friedrich Huttenwerke by the Allgemeine Elektricitats-Gesellschaft. The train consists of four stands of rolls with an average diameter of 2 feet 6 inches, and is used for the production of blooms and rails weighing 63 pounds per yard and up to 160 feet long and girders up to 14 inches deep by 75 feet long, and weighing 190 pounds per yard, from ingots of two tons weight. The number of passes allowed for heavy rails and girders is 21. The maximum speed of the rolls is 110 revolutions per minute and they are driven by three motors coupled together on one base and directly connected to the rolls, the moment of inertia thus being kept far below that of the single motor of the same power as the three. The normal output of the three motors is 3,600 horsepower, and they are capable of working up to a maximum load of 10,350 horsepower. The rolls are generally accelerated to their maximum speed in about four seconds, but when necessary this can be done in 2½ seconds. The current input to the motors ranges from 8,000 amperes at first starting, to 5,000 amperes at 1,000 volts for the last pass, and the power supplied thus varies between zero and 5,000 kilowatts. The motor generator consists of a 2,500-volt 50-cycle three-phase induction motor with a normal output of 2,500 horsepower, but capable of carrying an overload of 100 per cent for short periods. This motor is connected by flexible couplings to two 500-volt generators, each capable of giving nominally a normal output of 1,500 kilowatts, and a maximum output of 4,500 kilowatts at 300-375 revolutions per minute. The generators are connected in series and each is coupled to a cast steel fly-wheel weighing 26 tons and having a peripheral speed of 260 feet per second. The kinetic energy stored in these fly-wheels at 375 revolutions per minute is, therefore, 5,500 foot-tons, and if the speed were reduced to 300 revolutions per minute there would be available 20,000 foot-tons or 80,000 horsepower-seconds. If this speed reduction occurred in ten seconds, work could be done by the fly-wheel alone at an average weight of 8,000 horsepower.

When rolling 14-inch girders the input to the motor of the motor-generator set varies from 300-900 kilowatt and the output of the generators, as stated above, from zero to 5,000 kilowatts. This mill has been working since last July, and it is operated by the same man who formerly drove the steam engine now replaced by the electrical equipment described. It is estimated that the cost of rolling is now 10 per cent less than it was when the mill was driven by steam.

The whole of the mills in the same works are now electrically driven, the motors installed for this purpose are capable of exerting a maximum horsepower of 20,000 brake horsepower, and have all been supplied by the same firm.

Future Developments.

As regards future developments, it would seem that the greatest economies in production will be obtained with complete blast furnace and rolling-mill plants laid out for working on the continuous system; the gases from the blast furnaces being used for generating electric power by large gas engines and generators, or boilers and steam turbo-generators. The capacity of the generating plant required in such cases will simply be equal to the average demand of the whole of the motors installed, and therefore considerably less than the capacity of all the steam engines or gas engines that would otherwise be required. Moreover, the generating plant will be working under a fairly steady load, and therefore under the most favorable conditions. Even should blast furnace gas not be available, very material economy will be effected on this account, and the steam consumption reduced to one-half that of separate and independent mill engines. That such is the belief of those who have gone carefully into the matter, is evidenced by the fact that several large works of this character are now entirely electrically driven.

The tenth annual meeting of the American Society for Testing Materials will be held at the Hotel Chalfonte, Atlantic City, N. J., June 20-22.

BOOK REVIEW.

The Manufacture and Properties of Iron and Steel, by Harry Huse Campbell, Metallurgical Engineer for the Pennsylvania Steel Co., Maryland Steel Co., and the Spanish-American Steel Co. Fourth edition, 639 pages, 6⅛ x 9⅛ inches. Cloth. Illustrated and supplied with diagrams, charts and tables. Supplied by THE IRON TRADE REVIEW for $5.

Brief mention was recently made in these columns of the appearance of the fourth edition of H. H. Campbell's monumental work on "The Manufacture and Properties of Iron and Steel." The second edition constituted a great enlargement of the original work, while the third edition involved but minor changes.

The preface to the fourth edition states that many changes have been made, as "by constant additions the book had grown too big to be convenient," while "at a hundred places new knowledge has been interpolated as suggested by recent progress, or by friends, both here and abroad."

Mr. Campbell's most valuable contribution to iron and steel literature is so well known that a review of this fourth edition would stultify itself did it not constitute largely a comparison with the second edition. Most American metallurgists are indisposed to give the public, in well rounded out form, the results of their work, and doubtless there are not a few who lack the ability, did they possess the inclination. Mr. Campbell has both.

The second edition contains 862 pages; the fourth edition, 639 pages. By using a somewhat thicker paper the thickness of the new volume is made slightly greater than that of the old, despite the reduction of 223 in the number of pages. While the same amount of matter appears on each page, the pages are made slightly larger.

The Eliminations.

To eliminate more than one-fourth of the matter in a work so well put together as the earlier edition, and at the same time increase the real value of the work to the student of iron and steel who wishes a text book to read, rather than a work of reference, was a task which certainly could have been accomplished by no one but the author, but he has done it very successfully. The work is in all respects better, for the purpose to which it will naturally be put, than its predecessor. The changes, however, are not of such a nature as to invite a study of the new work by one who has endeavored, whether successfully or otherwise, to master the old one, except where they involve the introduction of new matter. The elisions

have been of the less technical and abstruse matter.

The eliminations are pretty uniform throughout the work. Part I, giving a popular resume of "the main principles of iron metallurgy" has been reduced from 48 to 37 pages. The description of methods and processes, down to "the history and shape of the test piece" has been reduced from 383 to 276 pages. The chapters on test piece, the influence of certain elements on the physical properties of steel, and the classification of structural steel, have been reduced from 171 to 96 pages. The least amount of cutting has been done in the part devoted to the general discussion of "The iron industry of the leading nations," this department being reduced by only 30 pages from the 218 pages formerly occupied. Nowhere else in iron and steel literature has there been any attempt, at all comparable in value to this one, to summarize the iron manufacturing situation of the world.

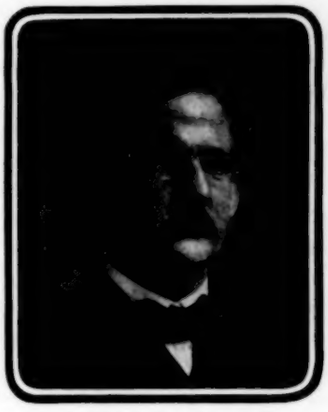
The Additions.

The additions are scattered through the work, and individually are not as a rule such as to attract special attention, or merit particular notation here. The first change in the work occurs on page 15 of the introduction, where one paragraph is rewritten. In the earlier paragraph the writer says: "There are many who disagree with this proposition (that acid steel is more reliable than basic steel of similar composition) but almost every American who disputes it will confidently assert that open-hearth steel is superior to Bessemer steel, and he will just as unqualifiedly put basic Bessemer steel in a lower place, yet his opinion on these two steels is no more capable of complete logical demonstration, than my opinion in favor of acid steel. The reasons for this opinion, founded on an experience extending over a score of years, may not be written in the compass of this chapter or this book."

The prospect of this reason ever being given is diminished when it is observed that this paragraph, with all its confidence of expression, is totally eliminated, and the following paragraph inserted instead: "A fact bearing upon this question is that in Germany there are two companies which make a business of special steel for forgings, tools, etc., etc. These companies use acid Bessemer steel for this work, although basic steel is cheaper. They are the only makers of acid steel in the great Ruhr district, and the basic Bessemer works do not invade their lines of business. This would indicate a belief in the superiority of the acid product."

It may, we trust, be fairly submitted that the above constitutes but a lame substitution. Neither the preceding nor following paragraphs are changed by so much as one word. It should not be inferred, from the fact of this citation being made, that the changes in general involve a withdrawal of opinion rather than an addition of fresh facts. The latter is the rule, but the rule has not been followed as far as the reader would probably like. The progress of the industry has afforded opportunity for greater additions than have been made.

An an instance of this, the section on the duplex process may be mentioned. Necessarily it has been rewritten, but it now contains no more than the two pages formerly allotted to it. We certainly trust it is due to the fact that it is a rewritten section that it appears in the present work in the form in which it does, for that form is not in keeping with the general purpose and intent of the work. The section starts by



H. H. CAMPBELL.

mentioning the duplex process, and then says: "At one works in Europe this practice has been carried on for some years," while it closes with the words which follow, these words constituting both the introduction and the dismissal of the subject of the duplex process in Alabama—"Notwithstanding these arguments, there are places where this combined process is advisable. Thus in Alabama the ores and coke are both inferior, and it is difficult to make iron suitable for a basic open-hearth in both silicon and sulphur. The duplex process answers this difficulty by permitting the blast furnace to run at a higher temperature and eliminate the sulphur without such stringent specifications concerning sulphur." Obviously the last word should be silicon and not sulphur. We trust this slip was due to the compositor, and not to any haste on the part of the author to get rid of this subject. It would merit much fuller treatment. The iron and steel industry as it is today does not exist for the purpose of establishing or illustrating metallurgical principles or theories, but for the purpose of so utilizing minerals from the ground that dividends may be paid to stockholders. Where this commercial process is being carried on, with prospects of much larger operations in the future, a subject is created which merits full treatment in a work of this character, and not a curt dismissal.

In the four years which have elapsed since the second edition was written, there have been developments which should call for much fuller treatment of certain subjects in this later work. The duplex process is one of these subjects; another is that of steel castings. The author has done no more for steel castings, in the way of fullness of treatment, than to refrain from reducing the space devoted from the ten pages given in the second edition. The disregard of the importance of this subject is well illustrated in the following extract from the present edition:

"The disadvantages of the small converters are indicated by the slow progress in their introduction and the discontinuance of operation in plants already built. The Clapp-Griffiths process once caused considerable stir, and yet in 1903 there was not a single converter of this type at work in America. Of the Roberts-Bessemer (misprint for Robert-Bessemer) plants only two were active in that year. There were eight Tropenas plants at work, one Bookwalter converter and two vessels of special design." The introduction of an obituary of the Clapp-Griffiths and Robert-Bessemer converters is gratuitous; it could as well have been written fifteen years ago. In a period when the manufacture of steel castings is rapidly increasing, and when new plants are being constantly built, a reference to the situation in 1903 is not in keeping with the dating of this work in October, 1906. Even Mr. Swank's iron and steel works directory of June, 1904, describes more special converters than here referred to, since it mentions 16 works containing 24 converters, while later Mr. Swank made a further presentation, which was referred to editorially by THE IRON TRADE REVIEW of Jan. 18, 1906, showing that to December, 1905, six additional special converters had been built, and eight were then being built, making a total of 38. If the use of the Bessemer converter for steel castings is wrong, as Mr. Campbell holds, then the spending of this money on them proves a commercial demand for more complete elucidation of the reasons. It is true that only about 32,000 tons of Bessemer steel castings were made in 1906, but that is double the tonnage of 1904, and is not a negligible matter. A work of this sort should not be based, in its

arrangement, wholly upon relative tonnages involved in different subjects, but should have regard also to the need for information upon them.

The statistical department is far from being brought up to date. In the second sentence of the statistical chapter the statement is made that statistics of the production of wrought iron cannot be obtained for the United States. Mr. Swank has, for 1904 and 1905, resumed the collection of wrought iron statistics, and will doubtless gather the data for 1906. Criticism is made of the confusion in steel statistics of Germany, but no reference is made to the insufficient character of those for the United States, caused by the fact that if steel (as in a Talbot furnace) is allowed to remain it is not weighed, but if it is cast into an ingot, weighed, and immediately a large part returned to the furnace, it takes its place in the statistics.

Some of the statistics are not brought up to date within several years. The table of pig iron production in the world appears to refer to the year 1904, a most unfortunate selection in any case. While it names individual districts producing as little as from 250,000 to 300,000 tons per year, it gives no individual place to the industries centered at Buffalo, New York, while Canada is subject to the injustice of taking place near the bottom of the list with 270,000 tons (in 1904) when in 1906 the production was 542,000 tons, the production having doubled in two years. A sufficiently accurate estimate of the 1906 production could have been made in July. A number of tables are, it is true, brought through the year 1905.

These remarks are in no sense intended otherwise than as suggestions as to the amount by which the changes in the past three years have influenced the revision. The work as it stands is a much more valuable contribution to iron and steel literature than was even the first edition. The additions constitute a measureable improvement, while the condensation of previous matter makes a much more attractive volume for the average reader, without in any way detracting from its value in other respects.

The Philadelphia & Reading Railway is installing machinery in its shops at Reading, Pa., to enable it to make repairs to steel cars. This has been found difficult to do because of the tedious process of straightening out dents without special appliances.

The Gould Co., Chicago, dealer in pumps, pipes and well supplies, has moved from the former offices, 24 North Canal street, to a new building erected for it at Franklin and Ohio streets.

THE BLAST FURNACE

Practically and Theoretically Considered at a Meeting of the Staffordshire Iron and Steel Institute.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.
Birmingham, Eng., April 22.

A meeting of the Staffordshire Iron and Steel Institute was held at the Institute, Dudley, England, on April 13, Mr. William Somers, president, in the chair. There was a large attendance, including the following: Messrs. R. Buchanan, vice president; J. Piper, treasurer; W. Carder, secretary; and Walter Jones, F. East Nurse, C. E. Edwards, J. Raybould, J. Woodhouse, F. Lewis, W. Rufus Hawkins, R. Edwards, and W. Kendrick.

The business of the evening was preceded by the election of J. Raybould and W. Paget, as auditors for the year.

Mr. W. J. Foster read a paper on "The Blast Furnace Practically and Theoretically Considered."

In this paper the author compared the theoretical measure and method adopted by Sir Lowthian Bell for the heat balance of a blast furnace 70 feet in height, with a practical method devised by himself. He referred to a paper presented to the Iron and Steel Institute[1] to ascertain the nature of the hot blast theory and the general system upon which the process is mathematically founded. This requires a thorough knowledge of the thermo-chemical conditions of the whole of the matter involved throughout the process. The author also pointed out a few practical questions overlooked by theoretical metallurgists, namely, the fact that by temporarily increasing the blast to an abnormally high temperature, there is a corresponding increase of internal and, to a less extent, external resistance to the blast in gases, which suggests that a corresponding increase of energy to overcome this resistance and force the gases through the furnace is required. It is also well understood that furnaces working with superheated air require a corresponding increase in the tuyere area, due to the increase in volume of the air, which involves more or larger tuyeres. In the first case, complications are introduced, while in the latter, the life of the tuyere is considerably reduced, which is independent of a reduction in life, due to increased temperature. The extra cost in stove repairs, due to overheating, etc., is a question which must not be overlooked. The author showed in the paper that it was physically impossible to economize when a certain temperature is reached, the conditions varying according to circumstances. He then presented a heat balance, which was estimated January, 1904, the cost of coke per ton of iron being at that time 23.36 shillings, as follows:

	Calories.	Coke in cwts.	Cost in Shillings.
Reduction of iron oxides	1391.000	3.912	3.130
Reduction of silica	254.470	0.716	0.573
Reduction of phosphorus	85.630	0.241	0.193
Reduction of oxides of sulphur	0.660	0.002	0.002
Reduction of oxides of manganese	18.090	0.051	0.041
Reduction of calcium in slag, estimated as sulphide	38.437	0.108	0.078
Expulsion of CO_2 from limestone	236.910	0.665	0.534
Fusion of pig iron	330.000	0.928	0.743
Decomposition of water vapor in blast	172.580	0.478	0.390
Heat carried off by gases including H_2O in coke, etc.	769.446	2.164	1.732
Fusion of slag	548.310	1.542	1.235
Heat carried off by tuyere water	50.992	0.144	0.117
Heat carried off by cooling water	31.875	0.089	0.072
Carbon taken up by pig iron	282.800	0.796	0.637
Loss due to radiation, absorption in foundations	727.164	2.052	1.635
Combustible matter in gases	5444.440	15.312	12.248
Total heat, coke and cost from 1.285 tons carbon	10382.800	29.200	23.630
Heat brought back with hot blast	695.340	1.954	1.650

The author also discussed the influence on blast furnace practice of James Gayley's invention of the dry blast, indicating that drying the blast accomplished more in economizing fuel than preheating.

In the discussion which followed Mr. G. H. Gibbs remarked that any calculations based upon a minimum of air consumption was fallacious, pointing out as an illustration that it was impossible to burn coal with the minimum of air required for consumption. With regard to the Americanizing of plants they had among them men who could put in modern plants if personal consideration were put on one side. Some of the plants were quite up-to-date, but they ought not to let the Yankees run away with them in everything. He proposed to enlarge the diagram given by the lecturer and to keep it for reference.

Mr. R. Buchanan thought the lecturer had shown considerable courage in attacking Sir Lowthian Bell. But he thought even the highest authorities ought, like the old theology, to be occasionally taken up and either verified or rejected. The famous experiments of Fairbairn had proved to be worthless because a sample of the iron used had been found and the analysis had proved to be quite wrong, which, of course, upset all the deductions. He understood that Mr. Foster did not claim to have solved the problem of hot blast. They really needed further most patient investigation to explain the tremendous result of using hot blast. He hoped Mr. Foster

[1] Journal of the Iron & Steel Institute, page 239, Vol. 2, 1893.

would further extend his observations and give them the result.

Mr. Siviter pointed out when a furnace had been driven fast for a time it usually worked most irregularly for a few days. Mr. Foster said that was so, and he had himself dealt with that question in his 1902 paper.

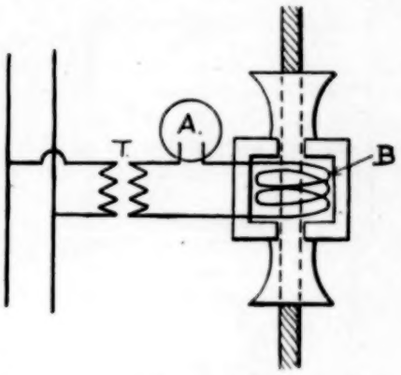
Mr. Tolley deprecated unfavorable comparison with America. He admired the present day blast furnace managers. They had been going down-hill for ten years, but now they were pulling up again. If the people had proper enterprise they would establish the finest steel works in the kingdom, and need fear nobody. They had the material, and the men, and there was no need to buy German steel.

The chairman proposed a vote of thanks to Mr. Foster. He thought Mr. Foster was under misapprehension about the need of Americanizing. The iron masters were not content to be displaced by America, Germany, or any other country. They had the men to do the work, and the plants. The only thing that prevented them competing with America and Germany was the lack of a proper waterway for the Midlands. Such conferences and discussions were necessary to the very life of South Staffordshire. It was necessary to bring before managers new ideas and the need of economy. Practical knowledge could only be gained by experience. Certain forms of engineering were sent over to England from America, because they were rather cheap. They were made with the intention of lasting only two or three years, and then being thrown on the scrap heap, the idea being that within two or three years the owner would have made enough money by them to be able to throw them away. The English on the other hand expected a machine to last ten years, in the first instance, and then to build them up to last them another two or three years. That was the other extreme. He thought they would do much better if managers were willing to throw away obsolete machines. Some of the members of the Institute had seen a German press at the works of his firm. But they would not see an English one because the English did not make them equally good. But he had no doubt that they would be able to make such presses, and then they would be able to compete on equal terms.

Mr. Foster replying regretted the paper had not been more freely criticized. He maintained that in his own paper he had been absolutely definite, and had given exact data, whereas Sir Lowthian Bell's conclusions were based entirely on assumption. In such cases he thought it would be better if they would be satisfied with the good work they were doing in America. Some of their work was splendid, especially the work by Mr. Gayley.

AN APPARATUS FOR DETECTING WEAR IN WIRE ROPES.

An apparatus for detecting variation in the cross sectional area or wear in wire ropes was described recently by C. McMann, at a meeting of the Transvaal Institute of Mechanical Engineers, the idea being suggested by the breakage of a hauling rope at a local mine. The accompanying illustration shows the scheme of the apparatus. Alternating current is obtained from any convenient source and passed through a transformer T. The secondary of the transformer is connected to a coil B, through which the wire rope to be investigated



Apparatus to Detect Wear in Wire Rope.

is threaded. This coil B may be designed to open up, enabling it to be applied to a rope without the trouble of threading the rope through it. At each end of the coil proper are bell mouths, which are to guide the rope into the coil. The coil is also enclosed in a laminated iron circuit to concentrate the magnetic field within it. An ammeter A is inserted in the secondary circuit. When there is no rope inside the coil B, the self induction is low and the current consequently is large. On introducing the rope, the coil B assumes the functions of an ordinary alternating current choking coil, the induction is increased and the current falls exactly in proportion to the size of the rope so introduced. In practical use, the rope is threaded through the coil B and slowly passed through it, the person in charge of the test watching the ammeter, the reading varying in direct proportion to any decrease in cross sectional area of the portion of the rope at that moment in the coil. By properly calibrating the ammeter, the exact amount of wear on the rope can be determined direct from the ammeter readings. If so desired, the ammeter may be of the recording form, thus obviating the necessity of an observer watching it during the time of the test.

A NEW IDEA IN SHOVEL MANUFACTURE.

A new idea in shovel manufacture has been developed by the Conneaut Shovel Co., Conneaut, Ohio, which manufactures shovels under the patent of Henry Mikola designed to cause the wear to come on the heel and the point of the shovel rather than in the center, thus promoting long life. This is done by dropping the point of the shovel, so as to prevent any bearing of the center upon the surface from which material is being removed. A radical departure has been made by this company in the method of designing shovels for special requirements in that it sends a man to visit plants where shovels are required, to examine the conditions under which they will be used. It is well known by users of a large number of shovels that the same article is unsuitable for use under all conditions; thus a shovel for removing the material from a smooth, hard surface, as a concrete floor, will be entirely unsuitable for shoveling from the top of a pile of stone, coke or ore, or from a pile resting upon soft earth. The shovel expert examines the condition under which the shovel is to be used and the works then design a shovel in accordance with these conditions.

The plant in which these shovels are manufactured is equipped with the machinery of the old Ronberg Shovel Co., formerly of Ashtabula, Ohio, and has under construction special machinery which will more than double the present capacity. A handle mill will be erected adjacent to the plant, which is located on a plot of about five acres between the Nickel Plate and Lake Shore railroads with connecting sidings.

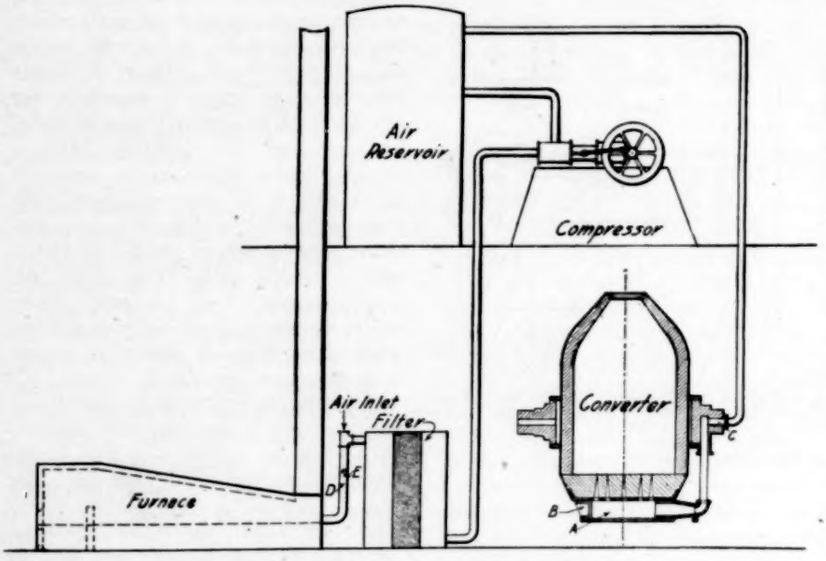
In the No. 1 grade of shovel, crucible steel of 0.60 carbon is used. The handles are of second growth of northern white oak. The plate steel used is first cut into proper shape in a large press, then passes to a set of rolls where the part attached to the shovel is reduced in thickness. It then passes to a machine for punching rivet holes for attaching the blade to the handle and the plate is then formed in a large press. The shovel handles are inserted by hand in another department. After the handles are attached, the shovel is tempered and strengthened at the point where the greatest resistance is necessary. All shovels pass through the hands of three inspectors before shipment and are guaranteed to the users, defective shovels being replaced free of charge, thus giving users the benefit of the elimination of broken shovel expense.

A NEW PROCESS OF STEEL MANUFACTURE.

A process of steel manufacture, which is a modification of the Bessemer process, is the subject of a patent (843,592) granted to Byron E. Eldred, New York city. The invention relates to a process for the manufacture of steel by progressive oxidation of the impurities in the steel in a manner similar to the Bessemer process. The inventor claims that many difficulties have arisen in the carrying out of the Bessemer process, due to the impossibility of controlling the temperature of the molten mass. In blowing the converter with an air-blast, the temperature of the steel often rises to a high point giving rise to reactions which are injurious to the metal and misleading to the operator. The object of the process is to burn off first silicon and then carbon, the oxidation of the former producing high temperature. Owing to the fact that no gaseous products of combustion accompany this reaction, the volume of escaping gas is small. The gas evolved is chiefly nitrogen from the air-blast. The heat loss as sensible heat is consequently less than that occurring in the second stage of oxidation, wherein the carbon is burned. During this latter stage, the volume of gas is much greater and the sensible heat losses of more account.

The invention here described concerns itself principally with the first stage of oxidation or the silicon slagging stage. The oxidation should proceed ordinarily successively from silicon to carbon, but this sequence of oxidation will occur only when the temperature is held sufficiently low. When the temperature rises above a certain critical point, the oxygen of the blast shows a selective affinity for the carbon and burns the carbon from the steel before the silicon is well oxidized. Reactions of this sort cause the production of poor material and often of steel containing a high silicon content. They also mislead the operator.

In the past, steam has been used to some extent as a temperature controlling agent, but on account of its oxidizing action on the steel, its high cost of generation and its high specific heat, it has not been found satisfactory for temperature control. At the high temperatures reached in the manner above described, the nitrogen of the air-blast has been found to have a deleterious action on the steel, the nitrogen combining with the metal to a certain extent to form nitrides. Another portion is occluded, and this cannot be removed, as is the case with oxygen by ferro-manganese or spiegeleisen.



APPARATUS FOR THE MANUFACTURE OF STEEL.

The object of the present invention is to provide a means for temperature control in steel manufacture, which will eliminate the troubles due to the reversal of the order of combustion of silicon and carbon, will prevent the formation of nitrides, largely reduce the amount of occluded gases, and, in addition, will have no deleterious action on the steel as regards oxidation or otherwise. The invention consists in keeping the temperature in the converter during the oxidation of the silicon at a point below the critical temperature, at which preferential oxidation of the carbon begins, by the introduction of a regulated draft current containing an endothermically-acting agent.

The apparatus used is shown diagrammatically in the accompanying illustration, A being the air box of the converter, B the twyer and C the trunnion air inlet. In connection with the converter a furnace is used, the products of combustion, which ordinarily pass up the stack as waste gases, being drawn wholly or in part from the furnace through the conduit D and drawn through a filter by means of the air compressor shown. At the same time, air is admitted through the air inlet and passes through the filter with the products of combustion. The compressor forces this mixture into the air reservoir from whence it is permitted to enter the converter.

The converter having previously been filled with molten iron, the blast will pass through it and oxidize the impurities. At the start of the operation a pure air blast is used, if desired. As the temperature rises, however, due to the oxidation of silicon, a damper E in the pipe D is gradually opened to allow the introduction of carbon dioxide and other products of combustion along with the air. The introduction of carbon dioxide results in a pronounced cooling action on the metal and the quantity needed to prevent the temperature from rising to the critical reversal point may be determined by observation of the flame. The method of operation may be varied to suit the conditions, different types of apparatus, kind of steel required, etc. It is not necessary to inject the gaseous mixture at the bottom of the converter; it may be introduced at the sides or top. The carbon dioxide may be introduced through certain twyers, while through others a pure air blast may be injected. In some instances, the filter may be dispensed with, especially in such furnace operations where coke-gas producers are employed affording products of combustion containing little or no soot.

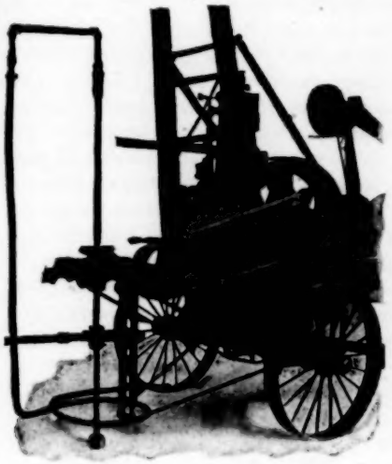
These products of combustion may be derived from any suitable source as heating furnaces of various types or from calcining kilns, which often afford products of combustion containing a greater percentage of carbon dioxide than is present in products of ordinary combustion. It is also possible to withdraw products of combustion from the converter itself, although at certain stages of the blow, the carbon dioxide is so low that a reliance must be had chiefly upon the nitrogen which largely constitutes the gas at certain stages of the operation. Reduction in temperature by the use of nitrogen is not altogether desirable.

The advantages claimed for the use of this process are the possibility of controlling the temperature of the converter by means of a non-oxidizing agent, which is ordinarily a waste product and the use of carbon dioxide or other prod-

ucts of combustion, resulting in an acceleration of the combustion of silicon, carbon, sulphur, etc., and enabling a blow to be made in a much shorter period than required in ordinary practice. The product of this process is said to be a metal resembling closely open-hearth steel, at a cost much less than the latter. This would enable Bessemer steel to be substituted for open-hearth steel in many fields from which it has heretofore been debarred.

A COMBINATION PROSPECTING DRILL.

Within the past year a complete combination prospecting drill has been placed on the market handling core, hollow rod and cable tools, or any two of these systems. This machine has been perfected to meet a demand in



CYCLONE DRILLING MACHINE.

territories where the conditions cannot be well met with one tool equipment, or in territories where the character of the formation is not known. The drilling elements employed are in no way an experiment or new, but the design and construction of the machine, making it possible to operate any of the systems successfully, is novel and will be of use to prospectors who encounter conditions in which one type of drill would prove unsuitable, while the proper equipment to meet the conditions would be highly successful. The cost of the drill work can be reduced in many instances; it may be desired to obtain cores of strata at considerable depth, and simply a record of the depth, thickness and character of the overlying material; the drilling can be started with the churn drill, which brings the material out in cuttings and continued down to a point where it is desired to obtain cores; the core attachment is then put to work and cores removed, getting the same practical result as by using a core drill from top to bottom, yet at a great reduction in cost from complete core drilling. It also is useful in territories where bed rock lies at great depth and a great amount of soft material must be passed through, or the material is badly broken, as is the case in many places. The outfits are built in a number of sizes and styles, and various equipments, to meet any condition that might prevail in any locality. They are built by the Cyclone Drill Co., Orrville, Ohio, in connection with its standard well drilling and prospecting outfits.

San Francisco's Rapid Rise.—In the annual review of conditions in California for the year ending April 18, 1907, issued by the California Promotion Committee, it is shown that the reconstruction work in San Francisco has been going on at a marvellous rate. It is estimated that 50,000 men are engaged in the building trades; 17,000 teams are hauling building material; and that thousands of other men are engaged in other reconstruction work. In all forms of rehabilitation during the past year, outside of replenishment of commercial stocks and private homes, it is estimated that $80,000,000 has been expended, and of this $30,000,000 was paid to labor. During the year building permits aggregating $60,189,923 in value were issued in San Francisco. The bank clearings in San Francisco for the year amounted to $2,074,299,568.15.

Site Not Selected.—The committee of the United States Steel Corporation appointed to select a site for the proposed new plant at Duluth, has returned after carefully going over the ground. Several sites are under consideration, but no decision has as yet been reached. The new plant will be operated as a unit in itself, not in connection with any of the existing subsidiaries of the corporation.

Heavy Shipments.—The shipments of pig iron from the Birmingham district during March were the heaviest known. The tonnage shipped exceeded the February movement by 58,000 tons. A large proportion of this movement was north bound. Total shipments were 175,601 against 117,184 tons in February.

The plant of the National Stove Co., Lorain, O., was greatly damaged by fire April 29, entailing a loss estimated to be in the neighborhood of $100,000. A considerable quantity of finished stock was damaged.

HIGHER PRICES

BELIEVED INADVISABLE BY ENGLISH MILL MEN.

Waste Cinder Being Utilized.—Activity in Ship Building Lines.—The Situation in England.

Office of THE IRON TRADE REVIEW.
Prince's Chambers, Corporation St.
Birmingham, Eng., April 30.

The recent iron trade quarterly meeting was unique in the paucity of sectional meetings. Usually, there are six or seven of these, but on this occasion there were only two. The Strip Association considered the advisability of increasing prices half a crown. The advance is badly wanted, in view of the high price of raw materials, but it was not thought expedient to make an advance, and the selling figure of £7 10s, with £7 12s 6d for small lots, was maintained.

This decision fairly summarized the position in other sections. The trade is strong, and there has been considerably more booking of late, but everybody feels that this is not the time to take liberties by putting on advances. Accordingly, such staple lines as marked bars, cold blast pig iron, unmarked bars and sheets, were all left unchanged, though a good business is being done and prices are firmer. A good weight of contracts was placed at and before the meeting, mostly for home consumption, but there is a fair colonial demand, Australia in particular being a very good buyer of bars and sheets. In the latter commodity there is greater steadiness than for some time, and it would appear that the climax has been reached at the standard of £13 15s. An enormous amount of business is still passing.

There was the usual large attendance of South Wales visitors but not much actual business resulted. The principality is not needing business just now, and high prices tend to discourage orders, but the trade is reported to be in a very wholesome condition. Stanley Baldwin presided at the meeting of the South Staffordshire Tinsheet Makers' Association at which recent prices were affirmed. Coke is still extremely dear, and coal is fully 2s above January prices, while slack is almost impossible to get. The activity of the ship building trade has induced a good demand for chains from the Black Country, involving a large consumption of small bars, and rods, while a large amount of wire,

both of iron and mild steel is on order. The foundries are busy, with unchanged prices, very substantial orders coming from Wales and the North of England for chilled and grain rolls. The general belief is, especially if the present steady prices can be maintained, that, as the shipping season has opened so favorably, very good summer trade, probably much better than that of a year ago, is in prospect.

The market has been strengthened by the advances of 2½ per cent declared both in the Midland and the North of England as the result of the accountant's ascertainments. But in this district the failure to restore the correct relationship with the North of England, for which another threepence per ton is wanted, has caused great disappointment. The iron workers are beginning to fear that the requisite advance is getting farther away, especially as the last threepence was only barely secured. If this fear should be realized, the sliding scale will be completely revised when the first two years of its operation are completed.

Utilizing Waste Cinder.

We have had at the Birmingham Assizes a singular law case rather significant of the increasing value of certain waste products. "Tap cinder" was formerly a worthless residual, but has lately become valuable, and the country is being scoured for it. Harry Hart had entered into a contract with Wm. Phipps, of Kiddermondis, to recover a quantity of this cinder which had been tipped into a pool at Wolverley. The tap, it was explained in court, yielded 54 per cent of pig iron. Mr. Hart seems to have been rather too vigorous, as in extracting the "tap" he let out the water from the pool which belonged to Mr. Phipps, and consequently destroyed a quantity of fish. His lordship ordered the too-vigorous fisherman to recoup the owner for the loss of the fish, but the court came to the conclusion that he had a right to extract the "tap," and therefore the injunction asked for was refused. It is almost needless to remark that "tap cinder" is not now thrown into pools in this reckless fashion.

The Indian government have just decided to allot about £350,000 for the purchase of new wagons and locomotives during the ensuing financial year. There have been great complaints for years past about the shortage of rolling stock, and it is calculated that this sum will provide something like 8,000 wagons, and 300 locomotives. It is expected that the order will be shortly placed with various leading firms, in addition to a quantity of passenger rolling stock.

Sir Hugh Bell, presiding at the annual meeting of Bell Bros., at Middlesbrough, on the 9th inst., said the profits amounted to £140,437 against £87,469 for the previous year, this being due to the price of iron having advanced from £2 6s 11d ($11.48), to £2 11s 4d ($12.56). The make at the Clarence works had slightly reduced. Sir Hugh pointed out that iron was becoming more costly to make, owing to the gradual exhaustion of their mineral resources, but they were acquiring other lands with a view to maintaining the flourishing condition of the company. A dividend of 4s 6d per share was paid on ordinary shares.

There has always been some little jealousy between the Thames ship builders, and those in the North of England. Ship building on the Thames of late years has been a diminishing quantity, but the industry is well represented by the Thames Iron Works Ship Building and Engineering Co. At the meeting just held, the chairman, A. F. Hills, strongly complained that the company had been unfairly treated by the government, many orders having gone north without any competition at all. Mr Hills emphasized the vital importance of maintaining a ship building yard capable of building, equipping, and repairing vessels for our own navy.

But the establishment could only be maintained by a share of government orders. He pointed out that the naval estimate for the year provides for one battleship of the "Dreadnought" type, five ocean-going destroyers, and twelve first-class torpedoes, and the directors hope to get a share of this work. The present year had opened more brightly than the last, but the directors did not think the profit of £58,000 warranted a dividend.

Great Battleships Launched.

Big battleships and their designs have attracted a great amount of attention of late. Three big ships, the Indomitable, the Invincible, and the Inflexible, have been launched within the last month. These ships almost approach the "Dreadnought" as regards cost and armament. Each will cost £1,736,000, and have a displacement of 17,250 tons. They have found work for great ship building yards at Glasgow, Newcastle, and Clydebank. The Fairfield Ship Building & Engineering Co. of Govan, had the honor of the first launch, and Messrs. John Brown & Co., built the Inflexible at Clydebank, while the third of the trio took the water on the 13th from Elswick Works, on the Tyne. There have been some very picturesque ceremonies in connection with the launching, but very great secrecy has been preserved with regard to the details of the ships. Quite a number of obsolete war vessels have lately been sold. The present is a very favorable time for getting rid of these old vessels, but not so favorable from the national point of view for building new ones.

Certain designs which Messrs. Vickers Son & Maxim have recently published for a new kind of warship with no funnels, boilers or deck erections have attracted a great amount of attention, and some people go so far as to predict that this will revolutionize the building of warships in the future.

Testing New Steel.

Demand seems to be creating supply in the production of new metals. The Hadfield Steel Foundry of Sheffield has recently introduced a new steel called the "Era," which the admiralty is now testing. The announcement of this was made at the recent meeting of the company. In another rather different branch of the metal trade Messrs. C. Clifford & Sons of Birmingham have produced a white metal called the "Seacliff" intended for a great variety of high class purposes for which aluminum and silver are now used. This is a very old established metal firm of Birmingham, and the inventors hope for a big consumption of this metal for various cycle purposes.

There seems a good prospect of continued activity in the ship building line. This is partly due to the extraordinary requirements of emigration, especially to Canada. At present every emigrant ship to Canada is fully booked for a couple of months ahead, and every ship going out is crowded. The Allan line has just found it necessary to construct several more ships, which are to be spacious, and splendidly equipped. Another big order for a battleship is about to come from Japan, and the latest news from Barrow is that an embassy is on its way to this country with an order for a gigantic vessel of 21,000 tons. It is not yet decided which of the big ship yards is to get this contract. At present the principal interest lies in the fact that the displacement of the giant goes 2,000 tons beyond that of our largest leviathan, the Dreadnought.

Institute Visits Works.

A visit was paid by the members of the Iron and Steel Institute recently to the works of Messrs. W. Somers & Co., Ltd., Haywood Forge, Halesowen, for the purpose of inspecting the large forging press and other heavy machinery. The party numbered about 100, and included

Prof. Turner, of the Birmingham University. The visitors witnessed the forging of a 17-ton ingot by an hydraulic press with a power of 3,600 tons. Great satisfaction was expressed with the success of the operation, Prof. Turner remarking that such a feat as well as the general equipment of the works showed that South Staffordshire was far from being played out.

The Shropshire Iron Co., has just obtained legal authority to alter its articles of association so as to enable it to acquire shares in a company which proposes to utilize some of its surplus land. A glowing account was given of the position of the company which has assets valued at £140,000 and last year paid a dividend of 10 per cent.

Messrs. Armstrong, Whitworth & Co. have greatly pleased their shareholders by paying 10 per cent dividend on the half year. Sir Andrew Noble, who presided at the meeting explained that this was due to the fact that several important contracts had been completed within the six months.

Concerns Consolidate.—The consolidation of four large industrial concerns of West Pittsburg, under the name of the Garland Corporation, with a capitalization of $3,000,000, has been announced. The companies consolidated are the Safety-Armorite Conduit Co., Woodhouse, Bopp & Co., the Garland Nut & Rivet Co., and the West Pittsburg Realty Co. The officers of the new corporation are: John W. Garland, president; H. L. Collins, vice president; F. C. Hodkinson, secretary; Charles Garland, assistant secretary; Robert Garland, treasurer, and Charles A. Glaser, assistant treasurer. It is stated that by reason of the consolidation, the plants can be operated less expensively; that the production and sales can be increased; that each individual concern will derive benefit from the ideas advanced by the managers of the various plants working in harmony; that saving will be effected and expenditures more wisely made by discussion and consultation among the heads of the various companies. The new corporation is unique in that the products of none of the four companies in any way has any commercial relation to the products of the others.

The Union Pacific railroad has awarded the contract for the construction of a one-story car shop of two wings, one 178 x 340 feet and the other 150 x 340 feet, and a one-story paint and wheel shop 178 x 302 feet, which will be built at the Omaha, Neb., shops.

HISTORIC MINE

Will be Restored to the Shipping List by the Cleveland-Cliffs Iron Co.

The Jackson mine at Negaunee where iron on the Marquette range was first discovered in 1844, but now for many years idle, was purchased about two years ago by the Cleveland-Cliffs Iron Co. which is preparing to restore the old-time producer to the shipping list. The Jackson is by no means out. It still possesses deposits of lean grade ore in its square mile of ground—it comprises all of section 1, town 47, range 27—and it is not impossible that new bodies of the higher grade material which made the property famous will be located.

The old open pit at the Jackson has been unwatered and cleaned up, preparatory to a resumption of mining operations at that point; a railroad spur has been built, and leading to it there has been constructed a trestle several hundred feet in length over which the ore to be taken out will be trammed. The ore bodies at the Jackson were probably as irregular and erratic as ever have been opened. The only plan of working was in following the veins, which narrowed and twisted in and out most surprisingly. It has been said that despite the experience gained in two generations at the Jackson, none of the superintendents ever learned to predict future developments at any particular point. The ore was found where it was found, and that is about all that could be said of it further than that the trend of the deposits was east and west and the formation appeared to be of comparatively shallow depth. Mining was not carried on below the 450-foot level, and for this reason there is belief that the present owner stands a good chance of finding bodies of ore of commercial value at greater depth than reached in the old workings.

The Jackson was highly profitable for two decades, after the payment of the initial dividend in 1861, but before that time the proposition was a losing venture and subsequently the returns became meager again. There is much general interest on the range as to what diamond drill borings at the Jackson will show.

The work of retimbering and equipping the section 16 mine shaft, started March 1, will be completed the present month. The installation of the new lining is already practically completed, and as fast as this work has been done new tracks have been put in for the cages and skips, which will hang one above the other. These cages and skips are much larger than the old ones, and the output of the mine can be considerably increased. The driving of another level has been started, and, when this is completed, the bottom workings will be 1,100 feet from surface. Section 16 is the Steel Corporation's deepest mine on the Marquette range. While the improvement work has been in progress, the underground employes who could not be worked to advantage have been transferred to other properties, so that none of them have lost any time. The machinery at the mine, which has recently been supplied with new boilers, is large enough to handle the new equipment of the shaft satisfactorily at this time, but it is anticipated that within the next three or four years, when greater depth has been attained, a larger plant will be necessary.

The machine shop will be a brick building, 150 x 75. A three-high mill, 14-inch train will be installed. For the present only hard steel shapes will be produced, these ranging from ⅜-inch up to 1½-inch in rounds and squares, and from ¾ x ⅜-inch up to 4 x ⅜-inch in flats. Construction work on the buildings will be rushed with all possible speed to secure completion before the advent of fall.

Business Volume Gains.—In a statement issued to the stockholders the Westinghouse Electric & Mfg. Co. reports that the orders received by it during the fiscal year ended March 31 aggregated $38,317,918, compared with $28,154,666 for the fiscal year of 1906 and $18,811,790 for the fiscal year of 1905. The value of the unfilled orders on the company's books March 31, President George Westinghouse stated was $14,616,441. The report of the company's business during the 11 months ended Feb. 28, showed gross earnings during that period of $30,659,579; net earnings of $4,453,133; other income of $1,300,454; charges, taxes and depreciation of $2,169,811; surplus for the 11 months of $3,583,776; dividend disbursements of $2,291,272 and a total surplus at the end of the period of $1,292,504.

The Susquehanna & New York railroad is constructing large yards near Williamsport, Pa. At Marsh Hill there will be built a big plant for car and engine repairing, including machine and blacksmith shops, power house and car shops. The line is to be extended from Lycoming county into Bradford county.

SHEET AND PLATE EXPORTS KEEP UP GAIN.

Exports of iron and steel sheets and plates from the United States to various foreign countries continue to grow at a steady gait. During the month of March, 1907, there was exported 2,736 gross tons of iron, sheets and plates, as compared with 3,591 gross tons in February, 1907, and 810 gross tons in March, 1906. For the nine months ending March, 1907, the total exports of these products amounted to 19,999 gross tons, against 7,230 gross tons in the corresponding period of 1906, and 3,449 gross tons in 1905. In steel, sheets and plates the March shipments to foreign countries aggregated 9,172 gross tons, compared with 5,948 gross tons in February, 1907, and 7,394 gross tons in March, 1906. The total exports of steel, sheets and plates for the nine months ending March, 1907, were 71,879 gross tons, compared with 51,324 gross tons for the nine months ending March, 1906, and 48,577 gross tons for the nine months in 1905.

Rail Exports.—In steel rails the exports for March, 1907, were 25,384 tons. In February, 1907, these amounted to 20,987 tons and in March, 1906, to 35,431 tons. A smaller total is shown for the nine months ending March, 1907, during which the exports amounted to 221,019 tons, as compared with corresponding periods in former years, when the figures were 257,179 tons in 1906 and 339,831 tons in 1905.

Iron Ore Imports.—During March, 1907, there was imported 75,997 tons against 101,799 tons in February, 1907, and 94,763 tons in March, 1906. Steady increases are shown by the nine months' record. For that period, ending March, 1907, the imports were 757,025 tons, corresponding with 689,546 tons in 1906, and 495,185 in 1905.

Pig Iron Imports.—Increased American demand for foreign iron is shown by the figures of pig iron imports. The receipts from foreign furnaces in March, 1907, aggregated 55,692 tons, compared with 48,982 tons in February, 1907, and 32,282 tons in March, 1906. In the nine months ending March, 1907, the imports totaled 387,694 tons, compared with 197,301 in the corresponding period in 1906, and 69,514 in 1905.

Crude Steel Imports.—Foreign mills sent 1,207 gross tons of crude steel into the United States during March, 1907, compared with 1,211 gross tons in February, 1907, and 1,756 gross tons in March, 1906. The crude steel imported in the nine months ending March, 1907, amounted to 15,229 gross compared to 14,465 gross tons in 1906 and 7,047 gross tons in 1905.

THE MOLDERS' STRIKE IN MILWAUKEE.

The progress made by the foundrymen of Milwaukee in breaking the molders' strike declared in the spring of last year is illustrated by the accompanying table showing the number of molders, coremakers, machine operators, handymen and apprentices at work on the first of each month after the strike was declared, and also the tons of metal melted per week and the percentage of the normal amount of work turned out each month. It will be noted on the first of April of this year that 1438 men were at work, and that the amount of melted metal per week was 104 per cent. of the normal. The successful methods adopted by the employers of Milwaukee to combat the molders' strike were detailed at length in THE IRON TRADE REVIEW of Oct. 25, 1906.

MEN AT WORK AND OUTPUT OF MILWAUKEE FOUNDRIES.

Date.	Molders.	Coremakers.	Mach. Oper.	Hdymen and App.	Total.	Total Melt Per Week. Tons.	Pr. Ct. of Normal.
May 19	75	95	56	164	390	996	37.0
June 2	116	127	72	281	596	1057	39.0
July 1	146	145	154	364	809	1427	53.0
Aug. 1	182	198	149	421	950	1816	67.0
Sept. 1	207	194	144	468	1013	2091	77.0
Oct. 1	211	198	147	503	1059	2119	79.0
Nov. 1	233	213	172	595	1213	2537	93.7
Dec. 1	244	251	170	633	1298	2261	83.0
			1907.				
Jan. 1	240	249	176	677	1342	1969	88.0
Feb. 1	265	260	194	715	1434	2669	98.6
Mar. 1	276	261	189	746	1472	2697	99.6
April 1	251	264	185	738	1438	2960	104.0

RUSSIAN IRON SITUATION.

Consul T. E. Heenan, of Odessa, has furnished an excerpt from a St. Petersburg newspaper on the possibility of exporting iron-smelting products from Russia as follows:

The present critical condition of the iron-smelting industry, as in the years 1903 and 1904, again brings to the front the question of the possibility of exporting that product. At present the factories are not working up to their producing capacity. In 1905 they had reduced their output by 8½ per cent against 1904, and the present reduction of 12 per cent appears likely to be still further increased. It is clear that the home market cannot find room for the full rate of production. The present glut in the market is to a great extent due to the disturbed condition of the country, which makes it unable to utilize the product, and when order and stability are restored then this will change. Meantime there seems only the foreign market as an alternative to a greater reduction. The active demand in England, Germany and America for their own production should make it possible for Russia to secure a market outside her limits. Thus Germany largely increased her own output (partly made from Russian ore), and yet had to increase her imports from England to 162,000 short tons, and still the combine Stahlverband has orders for eighteen months ahead and often declines orders as unprofitable. The situation is the same in England and America. On June 30 the American Steel Corporation had 6,000,000 to 8,000,000 tons of unfulfilled orders, an excess of 2,000,000 tons more than a year ago.

In 1906 an English firm asked the Ural factories if they could produce American sheet iron, which is similar to the Ural shining iron, and can not be more difficult to produce. Of late it has been observed that increasing quantities of pig iron are sent abroad from Russia, and contracts are being negotiated for the exportation of sheet iron. Still all this has failed to solve the problem of relieving the home market of the superfluous iron.

In connection with the question of the exportation from Russia of sheet iron there is first of all the fact that the Russian article differs in dimensions from the foreign product, but that is not an insuperable difficulty, since any properly arranged factory can easily adapt itself to such altered conditions of the demand. This applies to the manufacture of various kinds of rails, in which the profiles vary in many ways, which must be provided for in putting up the plant of such factories as produce this article. For the moment the price of this article would appear to be almost on a par at Harkov, in Russia, and at Hamburg, in Germany, so that the least change in price, an increase abroad, should make it possible for Russia to export her surplus of iron.

A BOOK ON GRAPHITE.

"A Study in Graphite" is the title of a booklet of 43 6 x 9 pages issued by Joseph Dixon Crucible Co., Jersey City, N. J. It contains a record of a series of tests made by Prof. W. F. M. Goss, of Purdue University, upon graphite as a lubricant. Prof. Goss used a machine especially designed for this work, and the tests cover a large range of conditions, including tests of different types of bearings and with graphite used alone and mixed with various ingredients, as oil, water, vaseline, etc. On account of the high character of the matter and the heavy expense attached to the conduct and publication of the tests, a nominal charge of 25 cents a copy is made for the booklet.

Crop Reports Having Effect on Securities.

Continuing irregular in its movement, the stock market during the past week has shown a slight upward tendency that has resulted in many small net gains. Although opinions of stock traders remain contradictory, there is a hopeful mood apparent that reveals faith in a more active market in the near future. Reports on the general crop outlook are having a noticeable bearing upon the action of securities at this time, and while there is at present no reliable basis upon which to establish either a strong optimistic or pessimistic view of the situation, yet the market is extremely sensitive to the conflicting statements that are daily coming from different parts of the country. While the international money markets are much easier, the financial conditions are not settled or clearly defined. Though rates are lower, frequent illustrations are being shown that where a great corporation desires a big loan it must pay rather high rates for the accommodation. An important event of the week in the field of railroad borrowing was the announcement by the Atchinson directors of an issue of $26,000,000 of convertible bonds to be offered to stockholders at par. The interest rate on the new issue is fixed at 5 per cent., while previous convertible bond issues subscribed for by stockholders at par have borne 4 per cent. With the turn of the month there has come a slight stiffening in the New York call money rate. The average price paid for these loans was 3 per cent. this week, compared with 2 per cent. last week. Sixty day loans in New York remained constant at 3½ per cent. this and last week. Though the month of April displayed no definite trend in prices, and at times was practically at a standstill, the result of the business in that period was a gain in the average prices of both railroads and industrials. These increases were 4.12 per cent. and 4.15 per cent. respectively. In previous years the month of April has generally been one of reaction. In six of the past 10 years both railroad and industrial securities have shown losses. The New York bank statement was complicated by the inclusion of the figures of a new member of the clearing house and this was held to account for a large part of the increases in loans and deposits. These gains were $16,902,700 in loans, and $14,416,600 in net deposits. The decrease in cash of $1,918,000 is larger than was expected. The surplus now is $6,824,625, compared with $5,899,525 in 1906, and $18,729,425 in 1905. Trading on the New York exchange during the week amounted to 3,824,565 shares, compared with 3,421,400 shares last week, and 8,762,900 shares the corresponding week in 1906. The bond market has been dull and irregular, sales amounting to $7,803,000 this week, compared with $13,488,000 the same week last year.

Financial Notes.

In compliance with the action taken by the board of directors at a meeting Feb. 26 the American Brass Co. of Waterbury, Conn., has increased its capital stock from $12,500,000 to $15,000,000. A certificate to that effect has been filed with the secretary of state.

Recent dividend declarations include the following: Niles-Bement-Pond Co., regular quarterly dividend of 1½ per cent on the preferred stock, payable May 15; Shelby Iron Co., a dividend of 5 per cent, payable May 20; American Radiator Co., regular quarterly dividends of 1¾ per cent on the preferred stock, payable May 15, and 1 per cent on the common stock, payable June 29; American Shipbuilding Co., regular quarterly dividend of 1 per cent on the common stock, payable June 1.

The Skinner Chuck Co., New Britain, Conn., has filed with the secretary of state a certificate authorizing an increase in its capital stock from $75,000 to $225,000. It is understood that a part of this increase will be called in immediately to take care of the increasing volume of business, but a portion of it will not be issued until later, it being subject to the call of the directors, as the business of the company may require additional capital.

The Phillips Insulated Wire Co., Pawtucket, has asked for permission to increase its capital stock to $2,000,000.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. May 4	Changes In Week	Date 1907 Ann. Meet.	Stock Outstanding	Dividend Basis	Dividend Being Paid	Dividend Date Last Div. Pay.
Allis-Chalmers	11¾	− ⅝	Sept.	19,820,000			
Allis-Chalmers pr	31¾	−1¾		16,150,000	.7 cum		Feb., 1904
American Can	6¾	+ ¾	Feb.	41,233,300			
Am. Can pr	55	−1		41,233,300	7 cum	5 Q.	Apr., 1907
Am. Car and Fdy	37¾		June 27	30,000,000		2 Q.	Apr., 1907
Am. Car and Fdy pr	119¾	+ ¾		30,000,000	7 n. c.	7 Q.	Apr., 07
American Loc	63½	+1¼	Oct. 5	25,000,000		1¼	Feb., 1907
American Loc. pr	110	+5		24,100,000	7 cum	7 Q.	Apr. 1907
American Ship.	74⅜	+1½	Oct. 2	7,600,000	6	1 Q.	Mar. 1907
American Ship. pr	104	−1		7,900,000	7 n c.	1¾ Q.	Jan. 1907
Am. Steel Foundries	8	− ¼	Oct. 1	15 810,000			
Am. Steel Foundries pr.	39			17,240,000	6 cum		Aug., 1904
Barney & Smith	70	−2	June 4	2,000,000	4	4	Mar., 1907
Barney & Smith pr	138⅜	− ½		2,500,000	8 cum	8 Q.	Mar., 1907
Bethlehem Steel	12		April 2	14 882,000			
Bethlehem Steel pr	49			14,908,000	7 n. c.	5 Q.	Feb., 1907
Cambria Steel	39		Mar. 19	45,000,000*	6	3 Q.	Feb., 1907
Cambria Iron	48	+ ¾		8,468,000*	4	4 S. A.	Apr., 1907
Chicago Pneumatic Tool	41½		Feb. 18	6,145,800	4	4 Q.	Apr., 1907
Colorado Fuel	35⅜		Oct. 21	30,132,000			Apr., 1902
Crucible Steel	9½	− ⅜	Oct. 16	24,578 400			
Crucible Steel pr	72½	− ¼		24,486,500	7 cum	6	Mar., 1907
Empire Steel	9		Feb. 27	2,281,400			
Empire Steel pr	50			2,500,000	6 cum	3 S. A.	July, 1906
Fay & Egan	100		Feb. 19	1,000,000	6	7 Q.	Feb., 1907
Fay & Egan pr	128½			1,000,000	7 cum	7 Q.	Feb., 1907
General Electric	148½	+1	May 14	63,643,600	8	8 Q.	Apr., 1907
Harbison-Walker	11⅜	+ ⅛	Jan. 21	18,000,000	6		
Harbison-Walker pr	74			9,600,000	6 cum	6 Q.	Jan., 1907
International Pump	27	−2	June 4	17,762,500		2	Apr., 1905
International Pump pr	79			11,850,000	6 cum	6 Q.	May, 1907
Lackawanna Steel	50		Mar. 13	34,971,400			
Lake Sup. Corp	9	+1	Oct. 2	40,000,000			
New York Air Brake	119	− ¾	June 18	10,000,000	8	8 Q.	Apr., 1907
Niles-Bement-Pond	130		Feb. 6	5,000,000	6	6 Q.	Mar. 1907
Niles-Bement-Pond pr	105			2,000,000	6 cum	6 Q.	Feb., 1907
Otis Elevator Co	36		March 18	6,350,300		3 A.	Apr., 1907
Otis Elevator Co. pr	104½	− ½		6,308,500	6 n. c.	6 Q.	Apr., 1907
Penn. Steel	60	−5	May 13	10,750,000			
Penn Steel pr	99			16,500,000	7 n. c.	7 S. A.	Apr., 1906
Pittsburg Coal Co	12¼	+ ¾	Feb. 11	32,000,000			Nov.
Pittsburg Coal pr	55			32,000,000	7		Apr., 1905
Pressed Stl Car	37	+1¼	Feb. 20	12,500,000		3	Aug., 1904
Pressed Stl. Car pr	92⅜	+⅝		12,500,000	7 n. c.	7 Q.	Feb. 1907
Pullman	165	−3	Oct. 17	100,000,000	8	8 Q.	Feb., 1907
Railway Stl. Spring	44		Mar 7	13,500,000		4 S. A.	Mar., 1907
Railway Stl Spring pr	94½	+1¼		13,500,000	7 cum	7 Q.	Mar. 1907
Rep. Iron & Steel	28¾	− ¾	Oct. 9	27,191,000			
Rep. Iron & Steel pr	84¾	− ¼		20,416,900	7 cum	7 Q.	
Sloss-Sheffield	56	+2¾	Mar. 5	10,000,000	5	5 Q	Apr., 1907
Sloss-Sheffield pr	99	−1		6,700,000	7 n c	7 Q.	Oct., 1906
Tenn. Coal & Iron	147⅜	+1⅛	May 7	22,553,060	4	4 Q.	Apr., 1907
U. S. Pipe & Fdy	37¾		June 26	12,500,000	4	4 Q.	May, 1907
U. S. Pipe & Fdy. pr	84⅜	− ⅛		12,500,000	7 n. c.	7 Q.	Dec., 1906
U. S. Steel	37⅛	− ⅛	April 15	508,302,500	2 n. c.	½ Q.	Dec., 1906
U. S. Steel pr	102	+ ⅞		360,281,100	7 cum	7 Q.	Mar., 1907
U. S. Steel 5's	97	−2⅜		463,798,000	5	5 A.	Feb., 1907
Va. Iron, Coal & Coke	71	+1	Sept. 17	8,641,600			
Westinghouse Elec	144½	− ¾	July 24	24,998,700*	10	10 Q.	Apr. 1907
West'ghouse Air Brake	148	−2	Oct. 1	11,000,000*		22½ Q.	Jan. 1907

Par value of shares, $100 except those starred, $50.

NEWS FROM MANY INDUSTRIES.

New Buyers:—

The Phoenix Foundry & Machine Co., St. Joseph, Mo., has been incorporated with a capital of $25,000 by Wilhelm Blum, Robert Blum, Henry Blum and Roy Blum.

The Ironton Iron Co., Ironton, O., has been organized with a capitalization of $300,000 by H. A. Marting, S. B. Steece, W. A. Murdock, Charles Peters and E. O. Marting.

The Oklahoma Malleable Iron Works Co., Shawnee, Okla., has been chartered with an authorized capital of $200,000 by J. R. Pring, Charles McCormick and H. D. McKee, all of the address given above.

The Ohio Boiler Co., Girard, O., has been incorporated with a capital stock of $50,000 by J. M. Enright, D. M. Job, C. E. Osborne, Joseph Smith and Hugh McAllister.

The Clough & Witt Machine Co., Cleveland, has been formed with a capital of $30,000 by James D. Clough, Mary L. Clough, E. W. Ellenbuyer, Charles Fruehauf and M. S. Roberts.

The Phœnix Machine Co., Cleveland, has been incorporated by William Howell, H. C. Gahn, James J. Maguire, W. H. McMorris and A. Fisher, with a capital of $10,000.

The Wingate Foundry & Furnace Co., Montpelier, O., has been chartered with an authorized capital of $10,000 by G. E. Morris, James W. Lamberson, W. S. Boon and S. L. Northup.

The American Electric Furnace Co., New York, has been chartered with an authorized capital of $50,000 by Edward Allen Colby, Newark, N. J.; Arthur Herring and J. Armstrong Rawlins, 45 Wall street, New York.

The Massachusetts Steel Castings Co., Everett, Mass., has been chartered with an authorized capital of $200,000 by Ripley L. Dana, Newton, Mass.; Arthur F. Johnson and Henry F. Knight, 50 State street, Boston, Mass.

The National Machine Works, 210 Illinois avenue, Atlantic City, N. J., has been incorporated with a capital of $15,000 by George Zippler, Pleasantville, N. J.; John M. Meloney and Edward N. Meloney, Atlantic City, N. J.

The Manufacturers' Brass Co., Plainfield, N. J., has been incorporated with a capital of $50,000 to manufacture brass and metal goods by George W. B. May, Frank A. Pope and Harry W. Marshall all of the above address.

The Fire Escape & Railing Co., Passaic, N. J., has been incorporated with a capital of $25,000 by Abraham Apple, Passaic, N. J.; Joseph Leshinsky, 203 Bourream street, Brooklyn, N. Y., and William Vamedek, 178 Third street, Passaic.

The Preston Car & Coach Co., Ltd., Preston, Ont., has been incorporated with a capitalization of $200,000 by George A. Clare, Frederick Clare, Chas. S. Wright, Donald M. Campbell, and others.

The International Snow Plow Mfg. Co., Ltd., Stratford, Ont., has been chartered with $250.000 capital by John Rankin, James M. Dennison, James W. Mowbray, Wm. J. Hackwell and Wm. Dyer; also were constituted provisional directors.

The Ontario Steel Tubular Axle Co., Ltd., Belleville, has been organized with $20,000 capital by Henry P. Thomas, Robert E. Colling, Wm. J. Thomson, and others.

The Frame & Hay Fence Co., Ltd., Stratford, Ont., has been incorporated with $100,000 capital and Robert Steele Frame, Duncan D. Hay and Robert B. Murray as provisional directors.

New Construction:—

Plans for a new foundry and machine shop for Otto Biefield & Co., Watertown, Wis., have been prepared.

The Diamond Chain Mfg. Co., Indianapolis, Ind., is about to erect a new plant in that city. The structure will be of brick, four stories.

The Curtis & Curtis Co., machinists, Bridgeport, Conn., is about to erect a brick addition 48 x 150 feet, one story. The contract has been awarded.

Excavating is under way for the brick and steel foundry addition 94 x 300 feet and other structures to be erected by the Union Mfg. Co., New Britain, Conn.

A five-story steel and brick building 96 x 120 feet, to serve as a warehouse, is being erected by the John Eichleay Jr. Co., Pittsburg, builder of steel construction work of all kinds.

Additions to the plant of the Southern Stove Works, Richmond, Va., which will double its daily output of 300 stoves, are now in the course of erection. Plans call for the expenditure of about $30,000.

The Manufacturers' Foundry Co., Waterbury, Conn., has completed plans for the erection of two additional factories 102 x 105 feet and 75 x 150 feet, respectively.

Landers, Frary & Clarke, New Britain, Conn., have awarded the contract for the construction of annealing and tempering rooms, two stories, 50 x 180 feet, of brick and steel construction. An ell three stories, 40 x 60 feet, will also be erected.

The Wabash Gear Works Co., Terre Haute, Ind., recently formed, is contemplating the erection of a plant for the manufacture of automobiles, automobile parts and other machine products. Rufus M. Brown, Hugh L. Warner and Frank McKean are directors.

The Valley Grey Iron Foundry Co., Saginaw, Mich., reports that the new plant which it will erect will be equipped with a 56-inch cupola. For the present the power will be electricity. The concern expects to make all kinds of machinery castings and will run a general jobbing shop.

The Detroit Steel Products Co., Detroit, has purchased a site of five acres in that city upon which it is planning to erect a plant for the manufacture of automobile springs, friction draft springs for railroad cars and drop forgings. The main building is to be 450 feet long, with two wings of 100 feet each. James G. Rumsey, 89-99 Fort street east, is general manager.

The Indianapolis Switch & Frog Co., Springfield, O., which recently sustained a heavy loss by fire, will rebuild at once as a fireproof structure, the main building of the machine shop 225 x 400 feet, which was almost entirely destroyed. The company states there was practically no loss of material or work in course of erection and temporary arrangements are now being made to complete as fast as possible unfinished orders at the earliest possible date. The equipment that was not seriously damaged will be restored and new machinery and facilities added so that operations will be resumed on a larger scale than before the fire.

General Industrial Notes:—

E. G. Grace, general superintendent of the Bethlehem Steel Co., South Bethlehem, Pa., reports that the recent damage by fire to that plant was not serious and that it simply required new roofing, partitions, etc.

The Columbiana Ore Co., Columbiana, Ala., recently organized, has elected the following officers: President, E. P. Keech Jr.; secretary and treasurer, G. R. Mueller; directors, Messrs. William C. Seddon, De Courcy W. Thom, Samuel C. Rowland and Richard H. Elmonds, all of Baltimore, Md.

Wilson H. Lear recently purchased at auction for consideration of $74,500 the old Lybrand and McDowell Stove works at Girard and Armingo avenues, Philadelphia. The plant has been unoccupied

for several years. It has not yet been announced what disposition Mr. Lear will make of the property.

The General Pneumatic Tool Co., Montour Falls, N. Y., at its annual election selected the following officers: President, Robert T. Turner; vice president, C. F. Carrier; secretary, James A. Sheppard; treasurer, Frank A. Hatch; directors, Robert T. Turner, C. F. Carrier, James A. Sheppard, Frank A. Hatch, C. D. Clawson, William H. Cronk and D. M. Pratt.

The C. A. Dreisbach Foundry & Machine Co., New Haven, Conn., recently organized, states that it is remodeling a plant in that city and will carry on an iron foundry and machine jobbing business. Charles A. Dreisbach and Geo. Hall, who have been connected with similar concerns in New Haven for a number of years, are general manager and foreman respectively. Most of the equipment has been ordered.

The directors of the International Harvester Co., at a recent meeting, reelected the old officers as follows: Chairman of the board, Charles Deering; president, Cyrus H. McCormick; vice presidents, James Deering, Harold F. McCormick, J. J. Glessner and William H. Jones; treasurer, Harold F. McCormick; secretary, Richard F. Howe; chairman of finance committee, George W. Perkins; chairman of the executive committee, J. J. Glessner.

The Detroit Steel Tube Co., Toledo, has increased its capital stock to $150,000 and has purchased the entire plant and equipment of the Harris Toy Co., of that city. The combined companies will occupy the building of the Harris Toy Co., which is 110 x 350 feet, two stories. There will be no change in the name of the Standard Steel Tube Co. The present officers are: F. W. Jewell, president and manager; O. A. Lee, assistant manager; W. P. Tyler, secretary, and F. H. Aldrich, treasurer.

Curtis & Co. Mfg. Co., St. Louis, reports that its new steel foundry, which is known as the St. Louis Steel Foundry, will turn out castings the latter part of May. For the first month or two the output of the new plant will not exceed 30,000 pounds a day of small miscellaneous castings as these are largely open-hearth and the furnaces will not be in operation until late in the fall. The buildings of the plant, which are almost completed, consist of a main structure 95 x 280 feet, pattern storage warehouse, fire proof construction, fitted with automatic sprinklers, 35 x 100 feet, and sand mill and stock house 35 x 100 feet. All the power, compressed air, water, etc., will be furnished from the present main power house. The company states that it is now prepared to accept orders for any castings from 5 to 5,000 pounds in weight. A specialty will be made of soft sound castings, suitable for high grade machinery and locomotive work. The company is also prepared to furnish high carbon, special manganese steel, stamp shoes, special cams, frog and crossing parts, hammered eyes, etc.

The General Fireproofing Co. has about completed additions to the plant at Youngstown, O., which will double the capacity of the all-steel furniture factory, and provide a very complete equipment for the lug bar and girder frame departments. For the manufacture of pin-connected girder frames, a shop 85 x 200 feet has been erected, with a railroad spur running through the entire length of the building. Adjoining the girder frame shops is the steel yard. This bar yard is covered by an electric crane of 100 feet span and 320 feet run. To accommodate the steady growth of the all-steel furniture department, a re-inforced concrete building 60 x 180 feet, two stories, has been erected adjoining the old factory. By use of pin-connected girder frames, beams and girders of the same depth are provided, which greatly facilitate hanging shafting. The office building has been enlarged to accommodate the reinforced concrete department, by the erection of a two story and basement addition 36 x 73 feet, connected with the former office by a wing 36 x 36 feet. Cement plaster applied over Herringbone expanded steel lath is used for the exterior finish.

Trade Notes:—

The Northern Engineering Works, crane builder, Detroit, has furnished the power plant of the Edison Sault Electric Co., Sault Ste. Marie, Mich., with a second 15-ton alternating current electric traveling Northern crane.

The Colonial Steel Co. has moved its New York office and entire stock from 43 John street to 177-179 Hudson street, where a larger warehouse has been taken.

The offices of *Machinery* are now located at 49-55 Lafayette street, corner of Leonard, New York, a ten year lease having been taken of the eighth floor of the twelve story building at that location.

Joseph T. Ryerson & Son announce a change in location in their Pittsburg and New York offices. The Pittsburg office, formerly in the Farmers' Bank building, is now located at 1072-1073 Frick Annex building, while the New York address, formerly 17 State street, is now 1611-1612 Arthur building, 74 Broadway.

Frazier, Fox & Spencer, Cleveland, consulting engineers, announce that the partnership under that name has been dissolved, J. C. Spencer retiring. J. W. Frazier and J. H. Fox have succeeded to the business, and will continue as consulting engineers under the firm name of Frazier & Fox, with offices in the Rockefeller building, Cleveland.

The Texas state penitentiary recently installed a 10-ton, three-motor, electric jib crane in the pipe foundry connected with that institution. The crane was furnished by the Northern Engineering Works, Detroit.

B. W. Brockett and A. F. Kwis announce that they have formed a partnership and will continue the practice of patent and trademark law, and the soliciting of patents and trademarks under the firm name of Brockett & Kwis, with offices at 410 Arcade, Cleveland.

The Berger Mfg. Co., Canton, O., is supplying many large municipal and business buildings in the great cities with its steel furniture. The company recently supplied New York county with the steel furniture and fittings for equipping the new hall of records. The work which the company supplies to the large office and municipal buildings consists of file trays, map tubes, roller shelves and wardrobes. The New York headquarters is at 210 East Twenty-third street.

The General Fireproofing Co., Youngstown, O., announces, coincident with establishing a branch office at 82 Second street, San Francisco, the appointment of W. W. Thurston as district manager. Mr. Thurston will devote special attention to exploiting pin-connected girder frames and cold twisted lug bars. W. E. Ramsey, a graduate of Illinois University and formerly engineer with the Expanded Metal Firproofing Co., Chicago, has entered the company's employ and is now at the home office, Youngstown. Jesse Briegel has also been engaged by the Chicago office as salesman.

Fires:—

The plant of the Acme Road Machine Co., Utica, N. Y., suffered a heavy loss by fire April 26.

The pulp mill of the Lake Superior Corporation, located in the Canadian Soo, across from Sault Ste. Marie, Mich., was recently heavily damaged by fire.

The A. L. Young Machinery Co. and the Sullivan Machinery Co., San Francisco, were recently damaged by a fire that visited the building in which they were located.

Merritt & Co., steel specialty manufacturer, Camden, N. J., suffered a loss estimated at $10,000 April 26 by a fire that originated from an explosion of a can of benzine. The fire was confined to the top floor of the plant.

The foundry of J. H. Newbury, Goshen, N. Y., was damaged by fire recently to the extent of $20,000.

TRADE PUBLICATIONS.

Fuel Economizers.—The Green Fuel Economizer Co., Matteawan, New York, in an 8-page booklet describes the application of the Green fuel economizer to the manufacture of water gas. Illustrations both in diagram and half tone form are presented, together with considerable information illustrating the manner in which a saving of 15 per cent in coal consumption in water gas manufacture is obtained by the use of the economizer.

Structural Material.—The American Bridge Co., of New York, 42 Broadway, 60 pages, 9½ x 12½ inches. An elaborately designed booklet presenting half tone illustrations of about fifty notable buildings either recently completed or in course of construction, the structural steel for which was supplied by this company. These range in size from the Hudson Terminals Building, for which 26,000 tons of steel will be required, down to structures containing only a few thousand tons. New York, Chicago, San Francisco, Pittsburg and Washington are well represented. The publication is bound in a rich brown paper, the cover being lined with a lighter shade. It carries a cover illustration, entitled "The Span," by F. Dana Marsh, painted as a decoration for the Wool Club, New York.

Shears.—The United Engineering & Foundry Co., Pittsburg, is distributing a booklet 6 x 3½ inches with about 50 pages, presenting a list of users of lever and vertical shears, together with some testimonials.

Pyrometers.—Price pyrometers for measuring temperatures as high as 3,000 degrees Fahr., are described in a 6 x 9-inch booklet of 35 pages distributed by the H. L. Dixon Co., Pittsburg. This pyrometer employs four wires in the thermocouple employing a double element of platinum iridium or rhodium. The efficiency of this couple is such that the cold end may be in a temperature as high as 900 degrees Fahr. The galvanometer employed has its armature suspended from a single point reducing friction to a minimum. The catalog presents diagrams, illustrations of the various parts of the pyrometer and gives directions for its installation. The last 15 pages of the booklet are devoted to many data on heat measurement including temperature constants, melting points, composition of fusing points of Seger cones, etc.

Coal Handling Machinery.—C. W. Hunt Co., West New Brighton, New York. Catalog 072. 6½ x 9½ inches. 64 pages. The catalog describes and illustrates a great variety of coal handling machinery, including steeple towers, boom towers, elevators, cable railways, automatic railways, etc. In addition, it describes electric and steam hoisting engines for use with the machinery, the Hunt noiseless conveyor, coal crushers, trolleys, coal valves, both of the shut off and measuring types, chutes, etc. Considerable information is given on rope transmission, including dimensions of sheaves and notes on the care of rope.

Valves.—Crane Co., Chicago, has issued a catalog of valves, fittings and specialties. It comprises 96 pages, 4 x 6½ inches and illustrates valves of all types, safety valves, mufflers, steam traps, separators, unions, tees and fittings of various types and sizes.

FOREIGN TRADE OPPORTUNITIES.

(These inquiries from prospective foreign purchasers are furnished by American consuls to the Government Bureau of Manufactures, Department of Commerce and Labor. Those in which the addresses are omitted are on file at the Bureau of Manufactures, Washington, D. C. In applying for addresses refer to the file number.)

No. 931. Electric cranes wanted.—Referring to his report published in *Daily Consular and Trade Reports* on Jan. 31, Consul W. Stanley Hollis now writes from Lourenco Marquez: Relating to the crane equipment on Gorjao wharf, the Lourenco Marquez Port and Railway Commission has decided to install an additional number of 3 and 5-ton electric cranes on the wharf and either a stationary or a floating crane or derrick, with a lifting capacity of from 50 to 60 tons. The present cranes in use are of German manufacture. They are revolving cranes, supported upon strong elevated frames, running with their own power up and down the water front of the wharf. Under each crane and between the side frames is a clear space, through which a train of narrow 3-feet 6-inch gage freight cars may run. The power for running these trains is supplied by the local street railway company. It is suggested that American manufacturers who can supply cranes likely to be acceptable to the port and railway commission should write to its official engineering head, His Excelency Major Costa Serrao, Inspector das Obras Publicas da Provincia, Lourenco Marquez, Portuguese South Africa.

No. 936. Steel rails.—A foreign business man writes the Bureau of Manufactures stating that he is in position to secure large government orders for rails for railways, the business amounting to 10,000 to 20,000 tons. He will be pleased to enter into correspondence with an American house prepared to take up this business, and desires offers for various qualities, f. o. b., at an American port. The offers must be binding for a time. The agent writes that there is good business to be done, but it must be done at once.

No. 942. Rice growing machinery.—Consul-General Michael forwards a copy of a letter from a farmer in India who states: I want to adopt a better and more modern method of cultivating rice, that practiced in the southern states of America where the work is done with gang plows. I wish to get into communication with American manufacturers of all kinds of implements for rice culture.

No. 948. Public works.—A foreign government is about to undertake the installation of a $950,000 waterworks for one of its cities, to provide for a daily consumption of 3,000,000 gallons; also $750,000 will be expended for an electric generating plant, and $750,000 for a new government administration building. Prizes of $25,000, $20,000, and $5,000 will be awarded for the best plans for the latter.

No. 949. Sugar-mill equipment.—A South American sugar-cane grower is arranging to spend $800,000 gold in establishing large plantations and installing a new sugar refinery. The American consul there has interested him in sugar-making machinery manufactured in the United States, and requests that the party be sent descriptive circulars, prices, and full particulars.

No. 976. Shoe factory equipment.—A group of shoemakers in an European country has received a government contract to supply 60,000 pairs of shoes annually, at about $2 per pair. A factory will be started at once, and American machinery manufacturers and leather and shoe findings dealers would do well to communicate with the parties. Illustrated catalogs and propositions should be sent.

WELLMAN FURNACES

In Operation in Japan — Learning Lessons from the United States.

"Japan may be the land of sunshine and flowers, but its people must come to America for their ideas," is the wording of a letter which William B. Mallett, recently superintendent of the American Steel Foundries at Sharon, Pa., received a few days ago from Y. I'Kawa, a nephew of Count Inenge, of Tokio, Japan, who a year ago traveled extensively in this country for ideas in regard to the manufacture of steel.

Count Inenge was the man who floated the loan for the Japanese government with which it carried on the war with Russia. He is a prominent man in that country and is at the head of many of the leading industrial enterprises. In his effort to keep posted, and, realizing that American shops were far in advance of those of other countries, he sent his nephew here on a tour of inspection. The young man spent several months at the foundry in this city, also at works in Youngstown, Buffalo and other cities. In the letter he says:

"I came back here the middle of last month. The voyage from Vancouver to the Empire of Japan was without particular incident. It was a wearisome journey and I was glad when I saw land once again, having traveled for 12 long days. Now I know that we must appreciate our scenic land of flowery kingdom, but I am much ashamed to say that our industrial progress should be put far below the level of America, as we have so much to learn from your nation.

"As to steel foundries I have been told there are nine firms in our country at present. A few days ago I came to visit two of them and I found in both of them a ten-ton open hearth of Wellman's patent installed. The working of the furnace and the running of the foundry were pursued entirely after the American process except the molding in which no green sand process has been tried or resorted to. The castings were pretty fair so far as they appear.

"To my great astonishment I found in the governmental works a good chemist melter who understood the business quite right even though he was in a petty plant. It is true that the steel foundry business in our country has progressed wonderfully since the war, but not so with malleable iron, for we do not hear of any advancement since the war. This will be fortunate for me.

"I am now very busy with my design of a small plant. I expect to have a foundry to handle five tons every day. I hope I will be able to sail for America again before long, for I learned much in your country."